The Dental Digest.

Vol. XI. CHICAGO, MARCH, 1905. No. 3.

Original Contributions.

EVOLUTION OF THE CENTRAL NERVOUS SYSTEM.

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Man, as Nordau (Degeneration) remarks, like all complex and highly-developed living beings, is a society of simpler and of simplest living beings, of cells and cell systems or organs each having its own functions and wants. These in the course of biologic evolution have become associated and have so changed as to perform higher functions than are possible to the single cell or primitive agglomeration of cells. In order that the collective organism may be able to perform its task, its constituent parts must submit to a severe hierarchic order. Anarchy in its interior is disease, leading rapidly to death. The single cell executes its biochemic work of decomposition and integration without being obliged to trouble itself about aught else. Its power of adaptation is so minute that if a cell is in the smallest degree less well nourished than its neighbor it cannot hold its ground against the latter and is immediately devoured by it. (W. Roux, Der Kampf der Theile im Organismus, Leipzig, 1881.) The differentiated cell, group, or organ already possesses a wider consciousness, whose seat is its nerve ganglia; its function is more complex and no longer operates wholly or even chiefly for its own benefit, but for that of the collective organism. It has, so to speak, a constitutional influence on the direction of the affairs of the whole organism, asserting itself in the power of the organ to suggest to the consciousness presentations prompting the will to acts.

The most exalted organ, the condensation of all organs, is the cerebral cortex, which is the seat of clear consciousness. It works least for itself and most for the commonwealth of the whole organism. It is the government of the state. To it come all reports from the interior now as well as the exterior; it has to find its way

in the midst of all complications; it has to exercise foresight and to take into consideration not only the immediate effect of an act, but also the more remote consequences for the commonwealth. When no question of the "ego," it is not subordinated to the little toe or the rectum, but all to the cerebral cortex, to which belongs the duty of directing the individual and of prescribing its law. It is consciousness itself. But how does consciousness form its judgments and its decisions? It forms them from representations awakened in it by excitations proceeding from the internal organs and from the senses. If consciousness allows itself to be directed solely by the organic excitations, it seeks to gratify its momentary appetites on the spot, at the cost of well-being it injures an organ by favoring the need of another, and it neglects to take into consideration circumstances of the external world which must be dealt with in the interest of the whole organism.

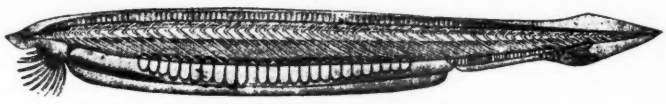
A man is swimming under water—his cells know nothing of it, and do not trouble themselves about it. They quietly absorb from the blood the oxygen which they need at the moment and set free in exchange carbon dioxid. The decomposed blood excites the medulla oblongata and the latter impetuously demands a movement of inspiration. Were the gray cerebral cortex to yield to a seemingly justifiable local demand of an organ, and allow an impulse to inspire to proceed to the muscles concerned, the lungs would fill with water and death of the entire organism result. Hence, consciousness does not obey the demand of the medulla oblongata, and instead of sending motor impulses to the intercostal muscles and those of the diaphragm, it communicates them to the muscles of the arms and legs, so instead of breathing under water the swimmer emerges at the surface. The typhoid convalescent feels a raging hunger. Were he to yield to this desire momentary satisfaction would result, but he would risk perforation of the intestines. His consciousness resists the desire of his organs for the benefit of the whole organism.

The cases are of course generally much more complex, but it is always the task of consciousness to test the stimuli which it receives from the depths of the organs, to comprise in the motor images which they excite all its earlier experiences, its knowledge, the directions given by the external world, and to disregard the stimuli if the judgments opposed to them are more powerful than

they. Even a perfectly healthy organism quickly goes to wrack and ruin if the inhibitive activity of consciousness is not exercised and if, through this want of exercise, its inhibitive strength becomes atrophied. If, however, the organism be not perfectly healthy, if it be degenerate, its ruin is much more speedy and certain when it obeys the urging of the organs. In such a case these organs suffer from either excessive or deficient use. They exact satisfaction not only pernicious in remote consequences to the organism but primarily to the organs themselves, or vice versa.

All organisms are developed cells and groups of cells. Compound organism cells retain the potentialities of single-celled organisms, which they surrender for the benefit of the whole organism. These potentialities are lighted into being by disease or disorder of the associating mechanisms constituting the checks on local

Figure 1.



— *Amphioxus Lanceolatus* from the left side, about twice natural size. (After LANKESTER.) The gonadic pouches are seen by transparency through the body-wall; the atrium is expanded so that its floor projects below the metapleural fold; the fin-chambers of the ventral fin are indicated between atriopore and anus. The dark spot at the base of the fifty-second myotome represents the anus.

action for the benefit of the cell commune or body. Cells having resumed low embryonic types for the benefit of the body retain the potentialities of the higher embryonic, which circumstances may stimulate either for the benefit of body or of the cell itself. This appears in skull and face embryogeny.

The skull is a development in part of the vertebræ and in part of dermal or membranous bones which, as in bony fish and reptiles, formed the protective armor of the skin of the head. As the head end of the spinal cord of the lancelet (amphioxus) grew (Fig. 1) in size the cartilage enclosing it developed to protect it. This was the earliest appearance of the skull in biologic as in fetal evolution. Later another skull developed in connection with this. The skull therefore has, as Minot remarks (Embryology, p. 465), a double origin, or, rather, there are two skulls which were originally distinct. In evolution from the lowest fish to the highest

mammal, and in the embryonic development of man, these become united.

The primary skull is an extension of the vertebræ which send side-outgrowths to cover the brain, as the backbone covers the spinal cord. This primary skull (Fig. 2) extended in front of the notochord (the spinal cord of the human embryo and the permanent spinal cord of the lancelet—amphioxus—or prevertebrate ascidan). In the lancelet it gave off two trabeculæ cranii or front skull plates. In back the primary skull (or chondrocranium) gives off (Fig. 3) two occipital or rear skull plates and two plates midway between the trabeculæ and occipitals. [NOTE.—"In describing this figure in detail," says Minot, "there is one remark to

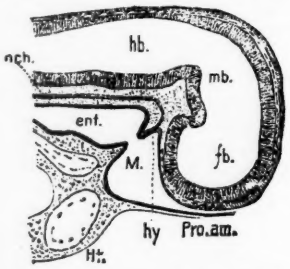


Figure 2.—Rabbit Embryo of 6 mm.; Median longitudinal Section of the Head. The connection between the mouth, M, and pharynx, ent, is just established; nch, notochord; hb, hind-brain; mb, mid-brain; fb, fore-brain; pro. am., proamnion; hy, hypophysis cerebri; ht, heart. After Mihalkovics.

be made, namely, that here we have clearly shown the true *diagnostic mark* of a mammalian skull. This mark is the rupture of the side walls, due to the pressure of the large lateral masses of the cerebrum. In front of the auditory capsules there is a large semicircular opening, the crown of the arch looking upward and forward. Only the lower half of the wall has thus broken outward; this "fault" forms the alisphenoid, while the orbitosphenoid (o. s), the so-called "lesser wing," is many times its size and is continuous over the archways with the cartilage that runs on backward into the supraoccipital region (s. o.). There is nothing similar to this in that sauropsidan skull which comes nearest to that of the mammal—the skull of the crocodile (See Trans. Zool. Soc., Vol. XI, Plate 65), while in birds the orbitosphenoids are very small, even when they are most developed, as in struthio (see Phil. Trans.,

1866, Plate 7), and in that class the alisphenoids almost finish the cranial cavity, being turned inward toward each other, on each side of the back part of the orbital septum. I lay special stress upon this rupture outward of the alisphenoid, and on the fact that the nasal roofs utilize the whole of the huge high-crested intertrabecula, because these are the most distinctive marks of the mammalian skull and they arise from two things in which the mammal shows its great superiority to even the highest sauropsida, namely, the huge volume of the cerebrum and the tenfold complexity of the nasal labyrinth. A third clear diagnostic sign is seen in this very figure—this is the peculiar development of the antero-inferior part of the oblique auditory capsule, due to the development of the

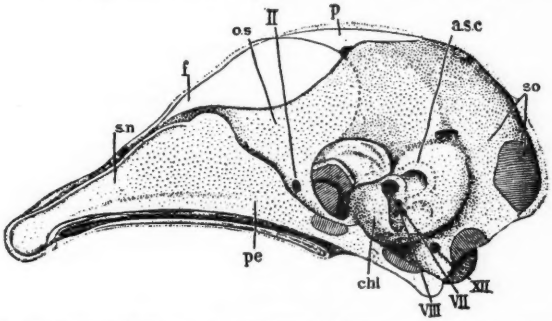


Figure 3.—Chondrocranium of an insectivorus Mammal. (Tatusia). After W. K. Parker.

coils of the cochlea. So that, at once, correlated with the sudden expansion, so to speak, of the cerebrum, we have these new and most important improvements in the organs of smell and hearing. At first sight, seeing how large the median bar (intertrabecula) is, with its internasal crest (perpendicular ethmoid and septum nasi—p. e., s. n.), it might be supposed that the mammalian skull was of the high kind, like that seen in many teleostean fishes, lizards and in birds. It is not so, however, but belongs to the low kind, seen in selachians and amphibians, and, like theirs, is hinged on the spine by a pair of occipital condyles. Hence, the eyeballs are kept far apart, instead of coming very near each other, as in most birds, where often nothing but a membranous fenestra is found between the right and left capsules and their special muscular apparatus. But the face as well as the skull of the mammal shows marks

of excellence such as are not seen in the sauropsida, even in the higher kinds, as crocodiles and birds. The great development of the nasal organs is correlated with a most remarkable growth of the bones of the upper jaw and the palate to form the "hard palate." This is found in rudiment even in the chelonia and in birds, but especially in the crocodilia, where, however, its excessive development—as in certain edentata, e. g., myrmecophaga—is not dependent upon or correlated with any great improvement in the organs of smell, but has to do with the peculiar manner in which these monsters take their prey."] These gradually inclose the primitive hearing apparatus, the otocysts (permanent in fish and embryonic in man), and are called periotic capsules.

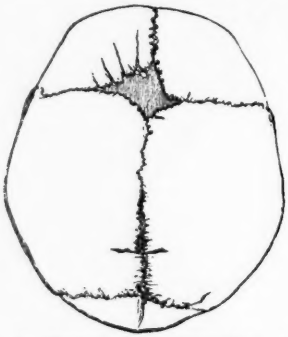


Figure 4.—Skull showing fontanelles. Gray.

This primary skull is at first cartilaginous, as in sharks. With the increase in the size of the brain in biologic evolution and in human embryogeny, this cartilaginous primary skull becomes insufficient to roof over the brain and gaps result. The fontanelles (Fig. 4) or soft places at the top, sides and back of the head of the new-born are expressions of this failure of the primary skull to cover the gains of the nervous system. This deficiency, while resultant on certain advances in evolution, would be a serious block to further advance or to life itself were it not that the fetal skin of all mammals retains an osteogenic function normal in reptiles, certain edentates and bony fish.

These cavities were filled by dermal bones (Fig. 5), which first served merely as armor in the skin of the head, but later came to be protectors of the nervous system. The following are representative

dermal bones in the embryonic human skull: The frontals, which form the chief part of the forehead. The sutures or dovetails of these normally disappear in the adult, so that the forehead seems to be but one bone. This union may not occur (Fig. 6), as in the case of the philosopher, Kant, who had a frontal suture all his life. The dovetails are replaced by solid bone through a process called synostosis. In the case of the frontal bone it is normal and

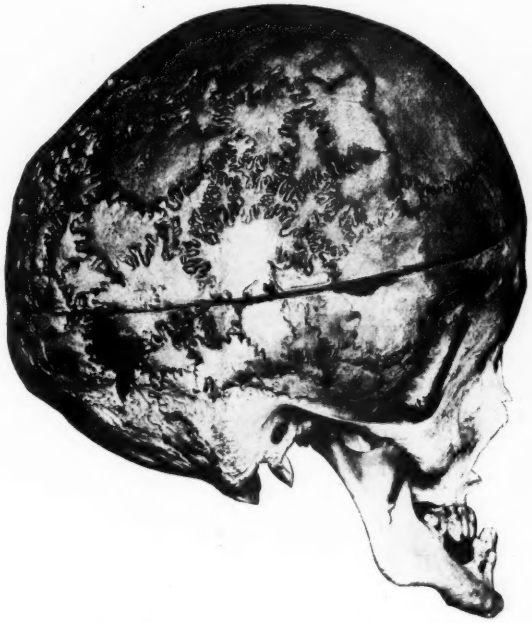


Figure 5.—Lateral view of skull, showing wormian bones. Charles A. Parker.

in the line of advance. Elsewhere in the skull it expresses defect, giving rise to various cranial states either absolutely degenerate in type or degenerate in certain races only. The parietals and interparietals are dermal bones united by synostosis to form the parietals or side bones of the adult human skull. The nasal bones (which together with the vomer form the nose) are dermal bones and so are the pterygoids and palatines. The maxillaries and premaxillaries (which with the mandibles form the jaws) are der-

mal bones. The mandibles are in part derived from the chondrocranium.

With rise in evolution and during the progress of human embryonic development these bones become fewer through their early cartilaginous union or synostosis. The openings in the skull resultant on the deficiencies in the chondrocranium are larger in the

Figure 6.—Front view of skull, showing open suture in center of frontal bones. Charles A. Parker.

sauropsida (birds and reptiles) than in the ichthyopsida (amphibians and fish), in the monotremata (egg-laying mammals) than in the sauropsida, in the marsupials (pouched mammals) than in the monotrema, and in the higher mammals than in the marsupials. Brain development therefore depends on the expanding power of the secondary skull formed by the dermal bones. These are degenerate bones, a mere reminiscence of that outer skeleton whereby

early fish and reptiles emulated the lobster. Any check to development which produces organism degeneracy is exerted on bone development itself and finally on the relation to other bones or dovetailing.

In accordance with the laws of growth, deficiency in one place usually results in increase elsewhere. The brain-protective function of the dermal bones, being later in development than their old armor function, is checked by degeneracy in two ways—either the bone does not grow in size sufficiently to unite with its fellows, or this growth occurs for benefit of the bone alone, and therefore that union with other bones occurs too early to benefit the organism as a whole. To the factors underlying this is due that failure of increase in intellect after puberty which appears in the higher apes and in some of the lower human races. These checks likewise tend to nutritional benefit of the older primary skull, whence result irregularities in development that constitute so many skull stigmata. The sutures sometimes do not form because sufficient cartilage is not produced to fill the gaps (Fig. 4). These secondary gaps are often filled by new dermal bones called wormian. Sometimes this deficiency coexists with too early synostosis elsewhere.

The development of the face depends upon enlargement and fusion of the mouth and nose cavities, and upon later partial separation of nose and mouth and nose cavities, leaving the posterior nose open. It depends further upon the growth and specialization of the face region, of which the elongation is the most prominent indication, and finally upon the development of a prominent nose. When the medullary tube of the notochord enlarges to form the brain the end of the head bends over to make room for that enlargement (Fig. 2). The bending of the head carries the mouth plate, which is to be the mouth, over to the front of the head. What develops the mouth cavity is the growth of the brain and the increase in size of the heart cavity, which expand to the front, leaving the mouth cavity between them. The mouth cavity represents two gill slits united in the front line. The nose (Fig. 7) is formed from two olfactory plates situated just in front of the mouth and in contact with the fore-brain. These olfactory plates grow in size by the increase in tissue and the resulting pits pass

away from the brain. At first these pits, although separated by what is called the nasal process, communicated freely with the mouth. The nasal process includes the origin of the future nose and of the future intermaxillary region of the upper lip.

The human face modified backward from the vertebrate type illustrates once more degeneracy of a series of related structures for the benefit of the organism as a whole.

Struggle for existence between the organs implies the creation

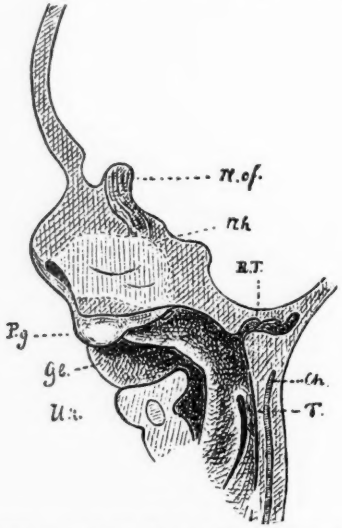


Figure 7.—Reconstruction of the Face of His, Embryo Sch. N. of, olfactory nerve; Nn, nasal cavity; R. T., Rathke's pocket; Ch, notochord; T, tonsil; P. g., processus globularis; Gl, palate anlage; Uk, mandible. After W. His.

of potentialities which must not only be inherited but must pass through periods when the newer type has to compete with organs already existing. There must therefore be the usual excess of material for growth, like that which occurs in fractures, where provisional callus is thrown out. This needful excess is obtained at the expense of other organs. If utilization of disappearing fetal organs suffices to provide this defects do not occur. If otherwise, they occur along the line of least resistance, which may be the higher or lower gains.

Since certain parts may disappear in the evolution of organs,

and certain organs during the evolution of organisms, and since the disappearance and developing tendency must center around the time when certain functions will be lost by the disappearing and others gained by the developing periods of stress must occur, around which the law of economy of growth will center, the struggle for existence between the parts of organs and between organs. Struggles for existence on the part of the different organs and systems of the body are hence most ardent during the periods of intra and extrauterine evolution and involution. During the first dentition, during the second dentition (often as late as the thirteenth year), during puberty

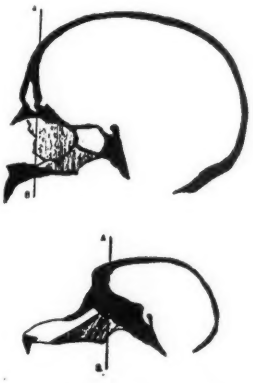


Figure 8.—Upper, human skull; lower, skull of Anthropoid Ape, showing human brain development at the expense of the jaws.

and adolescence (fourteen to twenty-five), during the climacteric (forty to sixty), when uterine involution occurs in woman and prostatic involution in man, and finally during senility (sixty and upwards) mental or physical defects may, as I have elsewhere shown, occur, a congenital tendency to which has remained latent until the period of stress.

When systemic balance, the result of evolution, is disturbed by change in environment, the organs, as has been shown experimentally, do not pursue their usual growth. Such disturbances are peculiarly apt to occur during periods of stress because of the then varying relations of different organs.

During the first extrauterine period of stress, between birth and three months, the brain is one-fifth the weight of the body, while

in the adult it is but one thirty-third. During the first six months the brain doubles in weight. The effects of stress during this period would, under the law of economy of growth, be felt either in diminution of the quality or quantity of the brain or in the preservation of these at the expense of more transitory structures. Here the teeth, alveolar process and jaws would be affected. In other words, when a given amount of nutriment is sent to the head there is a struggle between the face, jaws and teeth and the brain for the material, as observed in Fig. 8. If the jaws succeed in obtaining the most there is a return to the anthropoid, as observed in the lower figure, the brain case becomes smaller and the jaws larger. On the other hand,

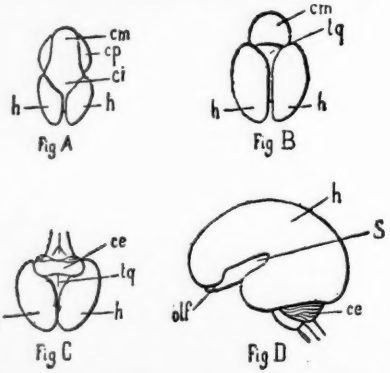


Figure 9.—A, Brain of a human embryo of seven weeks; h, cerebral hemispheres; ci, intermediate brain or thalamencephalon; cm, mid-brain; cp, hind-brain, B, Brain of human embryo about the beginning of the third month; h, cerebral hemispheres; tq, region of the corpora quadrigemina; cm, mid-brain. C, Brain of a human embryo at the middle of the third month; h, cerebral hemispheres; tq, corpora quadrigemina; ce, cerebellum. D, Human brain of the fifth embryonic month; h, cerebral hemispheres; olf, olfactory lobes; S, fissure of Sylvius; ce, cerebellum. (After Mihalkovics Entwickelungsgeschichte des Gehirns. Leipzig, 1877.)

if the brain receives the most nutriment the brain and skull develop at the expense of the jaws, as observed in the upper figure and in Fig. 5. During the period between two years and six the same factors to a lesser degree are present, while between seven and fourteen the brain has quadrupled in weight.

At birth the heart is small relatively to the arterial system, but this disproportion gradually disappears until puberty when, according to Beneke, the relation is changed. The larger the heart relatively to the vessels, the higher the blood pressure and the earlier, stronger and more complete is the development of puberty. The weight of

the heart from birth increases twelve and a half times. During this period strain interfering with heart growth would either affect it or, under the law of economy of growth, the more transitory structures for its benefit.

To a certain extent periods of stress resemble ancestral stages. Moreover, when there is a recapitulation of ancestral stages it often happens that evolution takes place without leaving traces of the various stages. This is especially the case in complex organs which

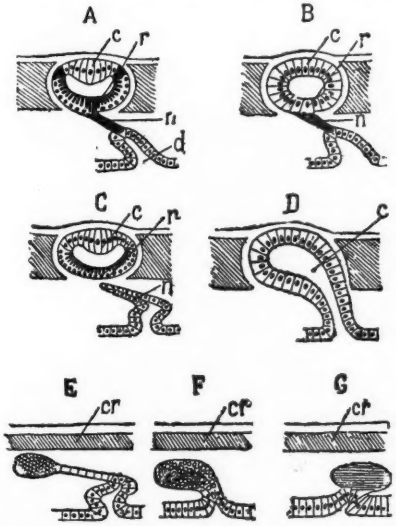


Figure 10.—Diagram indicating the progressive evolution and the degeneration of the pineal eye. A, Perfect pineal eye, as found in the slow worm before birth, or in the adult Sphenodon (Hatteria); c, lens; r, retina; n, optic nerve; d, divertialum of the thalamencephalon. B, Pineal eye in first stage of degeneration as it exists in Chamæleo and as it was in the slow worm before stage A. The lens (c) and the retina (r) are not differentiated. C, Pineal eye in the degenerate form found in Calotes and Leiodera; c, lens; r, retina; n, optic nerve in fatty degeneration. D, Very degenerate pineal eye, as in Cyclodus and like the earliest stage in the slow worm; there is no differentiation of the divertialum from the thalamencephalon. E, F, G, Other modes of degeneration of the pineal eye. The eye lies within the skull, and there is no parietal foramen; cr, cranial membranes. E, Ceratophora. F, Birds. G, Mammals. (After Baldwin Spencer.)

have been produced by many lines of evolution converging in a single structure—a structure which thus becomes the seat of a special function or set of functions.

The neuron, for instance, the ganglionic cell of the cortex, passes successively through stages corresponding to those which are to be found in the adult fish, frog, bird and mammal. Here development

consists in an increasing complexity of the cell with no formation of unnecessary rudimentary parts. This is also the case when the development of the brain of man is compared with the probable ancestral stages as displayed in the vertebrate series (Fig. 9).

In Fish and Batrachia,
The cerebral hemispheres do not cover the region of the third ventricle (thalamencephalon) from which the eyes arise.

In the Human,
Same embryo of aspects the seventh week.

Figure 11.—Human cyclops.

In Reptiles,
The hemispheres cover the thalamencephalon, but leave the region of the optic lobes (mesencephalon).

In the Human,
Same embryo of aspect the middle of the third month.

In Mammals,
The hemispheres cover the thalamencephalon, the mesencephalon, sometimes the metencephalon (cerebellum and medulla) and the olfactory lobes.

In the Human,
Same embryo of aspect the fifth month.

In the same mammals even of higher orders (e. g., some hapalidæ),	In the Human, Same embryo of aspect the middle of the fifth month.
The hemispheres are smooth.	

Perhaps the most striking instance of the sacrifice of an organ in local degeneracy for the benefit of the body as a whole occurs in the case of the pineal body. This undergoes the steps depicted in Fig. 10 for the benefit of the two eyes and the body. In the human cyclops (Fig. 11) the procedure is reversed; the median eye which becomes the pineal body develops at the expense of the two eyes and the general nervous system.

Each nerve and nerve group is endowed with motor, sensory and trophic powers, hence with increased development the force underlying these powers is distributed among more groups by a system of balance which prevents explosive tendencies. The growth of checks hence constitutes advance.

THE SHADOW AND THE SUBSTANCE.

BY G. S. JUNKERMAN, M.D., D.D.S., CINCINNATI.

The optimist is an individual who does not care what happens, so long as he is not the victim of the happening. The pessimist is one who knows that the rocket has gone up and is looking out for the stick which he knows is sure to come down. The optimist is a credulous sort of fellow, while the pessimist possibly avoids much trouble by anticipating it and in the end enjoying the fruits of his incredulity. A conclusion gained from judging the size and shape of an object by its shadow is a very uncertain and unreliable one, as the element of light in which the object stands modifies the form of the shadow. At the equator many hours of the day objects cast no shadows because, as is well known, they stand where their shadows would otherwise be. Small objects throw large shadows at sunrise and sunset. Consequently, in arriving at exact conclusions it would be wiser to make your observations on a cloudy day, when the real objects and not their shadows are taken into consideration.

The dental profession has a few optimists, but only enough of these as exceptions to prove the rule of pessimism. The position that dentistry occupies to-day has certainly furnished means to

sufficiently chastise its leading lights and enthusiasts, and not especially to exhilarate the lesser lights or encourage newcomers of ability into the profession. I sometimes wonder, when young men are seeking to enter the profession, whether they have considered these facts in taking the step. After some years of experience I have come to regard with a great deal of concern anyone who applies for entrance to a dental college, not that he could be considered as trying to break into the lucrative practice of someone already established, but because the question always arises in my mind as to the incentives that have caused him to take this step. I am not without conclusions on this subject either, and although they may not look pleasant in print, it must be understood that there are times in the lives of all of us when it becomes refreshing to our inner consciousness to be truthful at least with ourselves. The decision to make dentistry a life calling must have been reached after contemplation of the shadow at the time of sunrise, when shadows and objects are out of proportion. To-day is one without shadows, and I am looking at and recording facts as observed directly from the objects themselves. In this day of restrictions and requirements I always regard a prospective dental student with compassion and pity. Either he is one who has tried everything else within his sphere of observation and failed, and now as a last resort tries dentistry as a good thing, wondering why he has not seen it before, or he is too youthful and inexperienced to have had any thought about the matter. Perhaps he has just finished paying what seems a large dental bill, and has imbibed some of the enthusiasm that shows upon the dentist's face when receipting the bill—a condition which is most liable to be brought about in the system of one not accustomed to the money habit. The dentist himself cannot refrain from becoming somewhat enthusiastic at these successful periods of his life. It is his sunrise, but his victim sees only the shadow, and the second chapter of the story is written in the matriculation book of some first-class dental college, where one more dental student has commenced his college career. Births like this occur daily where no consideration or thought is given by anyone as to the fitness of such a student for such a career. Riches seem to be an assured fact to anyone who handles gold coming and going, as the dentist does, and the "*element of fitness*" and a *high school diploma* become synonymous

terms behind which hides too often an object of pity rather than a qualified dental student.

It is strange how shadows and substances come and go. Many years ago to my knowledge dentists attended dental meetings and always showed an air of contentment and thrift, large rolls of bills and the prospect of a month's vacation causing them to feel like men among men. Now I notice that they do not come so often, nor have so much money, nor stay so long in taking their recreation. The atmosphere of thrift is gone and the spirit of forced economy obtrudes itself from under a cloak of braggadocio or eloquent silence. Many a dentist of to-day has the characteristics of the chameleon where circumstances force him to change his color. He appears suddenly at the sea-shore with new clothes and sufficient funds. He stands high in his society and impresses his fellow-members not only with his thrifty appearance but with his large presence and store of wisdom. He takes on a color different even than that of his surrounding medium and becomes conspicuous and prominent on account of the change. A few months later his color changes again. You see him now in a dark habitation, with fringed trousers and an oil and wax-stained coat. The fire has gone out of his eye, and we now see the substance where at the sea-shore we saw only the shadow of misconceived greatness. He is economizing for another excursion or compensating for the last one.

Too many dentists! say the National Association of Dental Examiners, requires students to attend two more years in the high school and one more year at dental college. The result of this would be that with the five hundred dollars a year that they have to spend, and the five hundred dollars a year that they would have earned, there would be a total of three thousand dollars that the dentists would be poorer at the beginning of their career. This embargo would result in decreasing the number of dentists very much to the inconvenience and harm of the public, which the examiners are sworn to serve, and would not improve the quality which seems to be the heart's work of these bodies of gentlemen. This is a fact upon their own assertions, since it is acknowledged by them that there has been very little if any improvement in the quality of dentists since the increase in preliminary requirements was exacted for students entering the profession. Three

thousand dollars is not very much money, but it is more than the great majority of dentists have accumulated at the close of their careers. "Give us a cure for the evil," I hear the cry. You cannot change the spots of the leopard. The evil is an inherent quality. The *profession* itself is the *evil* itself. Its claims do not come within the pale of the earthly trinity, namely, life, property and salvation.

There sits each year a body of men who flatter themselves that they are practicing a branch of medicine, and like an aggregation of ladies at a pink tea, they jolly each other into thinking that they are the Nestors of the profession. In this misguided sitting would be a very suitable place to experiment with the Osler chloroform system. For many years it has been attempted to tack dentistry on to the tail-end of medicine, but up to the present very little good has come of it. This futile attempt has been only a detriment to the progress of dental art, and if successful is still a detriment. The same time and energy in the past years might have been better spent in fighting for dental independence rather than medical slavery, but the desire and vanity of being called "Doctor" has too often blinded dental disciples into forcing their society into incongruous circles, thereby being trampled under foot and overlooked, when if dentistry had been placed upon a pedestal of its own it would have forced public recognition as a high art. Dentistry should stand upon its own merits and by its own strength, and it might grow stronger in its attempts to do so.

Why have not the builders of musical art struggled to be considered a part of medicine? Music is a therapeutic and remedial agent pure and simple. It is acknowledged effective for the insane as a soporific, a stimulant to the soldier entering battle, and a trainer of all those qualities of the mind which modern medicine takes so much note of in treating bodily ills. Yet it is plain that music as a part of medicine would have suffered greatly as an art, and would not have attracted the great composers and artists and gained the general public recognition of high and low degree, if it had been advocated only for medical treatments.

There remains some doubt very manifestly expressed that dentistry is a very broad and learned profession. The branches taught in our dental colleges are many of them embellishments rather than necessities. Broad education and cultivation are valu-

able in any calling, and are now considered necessary even in business life. They are not a detriment, but are they requisite to dentistry? Herein lies the inherent evil in our profession. Dentistry requires principally manipulative skill to render practical services, and that is about all the public demands. The profession may demand more, but those who possess this mechanical skill will go on practicing it, and the public will be satisfied with the work of a skilled mechanic without questioning his educational training. We may not like this, but such is the condition at this time. The shadow that you are pursuing I cannot believe is any better. If the profession is not broad enough to require the services of a learned man you will have to blame the calling itself and not those who are practicing it. Not only ability but public appreciation is required in order to command a high reward. You may talk about the etiology of disease, the physiological action of drugs, bacteriology and all kindred ologies, but when dentistry is being practiced successfully with no other medicaments than hot water and a cake of castile soap, in conjunction with some manipulative ability, it is time to build a larger foundation before proceeding with the superstructure of dentistry, and temporarily at least to cut out some of the embellishments—or drop the profession altogether as one not requiring the services of a broadly cultivated man. If you judge dentistry by the size of the shadow you will find it very large at sunrise and at sunset, but in the zenith of your power, in the middle of life when your needs are the greatest, I fear that you will be doomed to bitter disappointment.

To sum up and make clear the object of this paper, I will state that it is not my intention to hurt anyone's feelings or to dampen the ardor of those enthusiasts who are found in all callings of life, but we started on the principle of being truthful and calling a spade a spade, and I feel that the statements herein made are supported by the best of evidence. It does not require very much gray matter to practice dentistry to the satisfaction of the laity, according to the manner in which it has been educated and to the degree of its appreciation. Let us make progress backward. Place dentistry in the field of refined mechanics and cultivate the public to appreciate the useful and the esthetic. Titles in an American-grown art are not appreciated by Americans, and the thin

veil of your disguise will be seen through by those who seek the substance and not the shadow. Establishing standards or raising them will not broaden this particular calling, bring it within the "pale of the trinity," or cause men of higher qualifications to enter it. If men of lesser ability can accomplish the ends of dentistry, why waste energy by requiring men of greater ability to enter it? If you wish to raise a house two feet, why raise it four for the purpose of letting it down again? Some men have thought to sprout wings and soar with dentistry into the clouds, with such graceful movements as to attract others who were looking up, but when the law of gravity began to act, down they came wings and all to again assume their natural positions, with dentistry much the worse for the unnatural flight. Dentistry is a great something, but you have not proved it to the public.

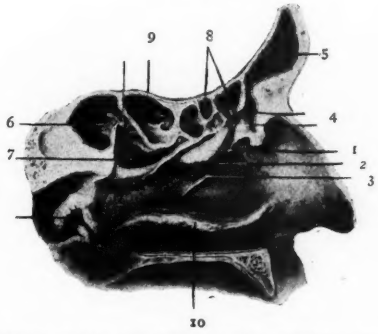
Would it not be wiser to accept gracefully for the present a conclusion which will be forcibly obtruded upon its disciples—the public estimation of dentistry—acknowledging it to be a calling which demands mediocre mental training, and place it on the plane of refined mechanics, rather than continue to chase the unnatural and exaggerated shadow thrown by a distorted and diminutive substance? Shall we continue to wave our pompons and beat our tom-toms in the wild effort to attract men who have spent energy and many years of time seeking an education to fit themselves for life, and having inveigled them into our ranks only to make the discovery that their years of education avail them nothing in their line of work, unless possibly to assist them to bear their unhappy lots in tolerating the refined torture inflicted upon cultivated men by an unrespecting public. A good ignoramus is better than an educated rascal, a good subject than a bad king, and it does not matter much whether dentistry occupies a high or a low position provided it subserves its purpose in the world's economy. The struggle for the high and unattainable is a worthy object only to the degree of progress, but it ceases to be progress when idle dentists, dissatisfied with their humble lots and seeking to satisfy an extraneous ambition, reach with outstretched arms into the clouds for light and glory, when a proper appreciation of their positions and of their calling would cause them to busy themselves with the relief of the physical sufferings of their fellow-men.

THE NASAL FOSSÆ AND THEIR ACCESSORY CAVITIES.

BY W. B. STEPHENS, M. D., SAN FRANCISCO. READ BEFORE THE CALIFORNIA STATE DENTAL ASSOCIATION, AT SAN FRANCISCO, MAY 16-18, 1904.

The proximity and intimate relation which the nasal fossæ and their accessory air cavities bear to the teeth is my justification for bringing these important parts to your attention to-night. I will endeavor to give a brief preliminary sketch of the typical anatomy of these chambers, leaving variations to be spoken of in conjunction

FIGURE I.



THE EXTERNAL WALL OF THE NASAL FOSSA.—(Logan Turner.)

In this specimen the middle turbinal bone is removed, showing beneath it a rounded body called the *bulla ethmoidale* (1). Inferior to this is a thin curved bone, the *processus uncinatus* (3). Between them lies a groove named from its form *hiatus semilunaris* (2). This recess receives at its upper end the exit from the frontal sinus (5) (*infundibulum*, 4) and also the exit of the anterior ethmoidal cells. At times the frontal sinus communicates directly with the antrum, see Fig. VI. The exits of the posterior ethmoidal cells (9) and the sphenoidal sinus (6) are seen to be into the superior meatus (7). (8) is the inferior turbinal bone

with the slides. The exact course of the outlets of the accessory cavities will also be described at that time. In the anatomy of these parts some of your own colleagues, notably Cryer and Talbot, have done most admirable work.

The Nasal Fossæ.—Immediately above the mouth lie the two nasal fossæ, the roof of the one forming the floor of the others. The

fossæ are more or less symmetrical chambers separated by the septum, a thin plate, anteriorly composed of a triangular-shaped cartilage, posteriorly of bone. The floor is antero-posteriorly horizontal, transversely concave. The roof, horizontal in its central portion, gives passage through sieve-like openings to the olfactory nerve; anteriorly it slopes downward and forward, posteriorly downward and backward and forms the anterior inferior wall of the sphenoidal sinus. The internal walls are formed by the septum and are usually smooth.

FIGURE II.

TRANSVERSE SECTION.—(Cryer.)

The floors of the antra are usually on a level with the floors of the nasal fossæ, but in this case they extend below and are in intimate relation with the alveolar processes of the maxilla. Access through an alveolus would be easy in such a case. In marked contrast to these antra are the ones shown in the next figure. The frontal sinuses in this specimen extend well over the orbits. At times they extend backward almost to the apices of the orbits.

The external walls are by far the most important and interesting. Running almost horizontally along each of these walls are three bodies, termed the turbinal bodies; three scroll-like bones covered with erectile tissue and mucous membranes and denominated inferior, middle and superior, in accordance with the location occupied by each. Upon cross section the cavities are seen to be irregularly triangular and the turbinals progressively nearer the septum from below upward, also decreasing in size in the same order. The

overhang of the turbinal bodies naturally forms three channels or meatuses, also called, from their position, inferior, middle and superior. They correspond in length to the turbinals. The inferior meatus anteriorly receives the lachrymal duct, the drain from the eye. Anteriorly it is narrow, widening out as it approaches the posterior nares. It forms the chief passage for the expired air. The middle meatus, flaring at the front, is the main passage for the inspired air. As the olfactory portion of the nose is situated high up, the inspired air thus reaches that portion before it is drawn into the lungs, and the individual may thus be informed of the presence of odors. Into the middle meatus the frontal sinus, the maxillary sinus and the anterior ethmoidal cells find their exit,

FIGURE III.

TRANSVERSE SECTION.—(Cryer.)

Showing the antra small and above the floor of the nasal fossæ. Access to these antra through an alveolus would be practically impossible.

while the superior meatus is the receptacle for the posterior ethmoidal cells and the sphenoidal sinus. These accessory cavities, or as they are usually termed, sinuses, consist of two frontal sinuses, two sphenoidal sinuses, two maxillary sinuses, or antra of Highmore, and two groups of ethmoidal cells. They each gain their name from the bone in which they are situated. The frontal sinuses are between the inner and outer tables of the frontal bone. They are not present at birth, but appear between the ages of two and seven years and do not attain their full size before the twentieth year. They are in the region above the root of the nose and in the superior and nasal side of the orbit. They vary greatly in size, shape and the direction in which they extend. They are generally approximately symmetrical and separated by a thin plate

of bone. Their exits are found in the respective floors of the sinuses, an admirable place for drainage. (Fig. I.) The ethmoidal cells are located and packed at the inner angle of the orbit in the lateral mass of the ethmoid bone. (Figs. I, VI.) They are usually divided into anterior and posterior cells. The anterior cells empty into the middle meatus, the posterior into the superior meatus. The anterior cells are in close relation to the frontal sinus above and to the antrum below. (Fig. V.) The most posterior ethmoidal cell is usually separated from the sphenoidal sinus by only a thin wall,

FIGURE IV.

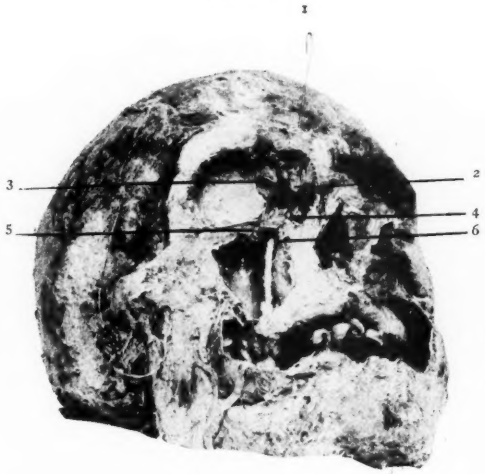
TRANSVERSE SECTION OF A FETAL HEAD.—(Cryer.)

Showing the alveolar process in contact with the floor of the orbit, the germs of the teeth occupying the sites of the antra.

so that the sinus might almost be regarded as a still more posterior ethmoidal cell. The two sphenoidal sinuses, the right and the left, are separated by a thin, bony septum. These sinuses are more frequently asymmetrical than symmetrical. They are situated in the body of the sphenoid bone, their outlets being in the anterior wall and emptying into the superior meatus. (Figs. I, VII.) The last of these sinuses, and the most important from a dental standpoint, are the antra or maxillary sinuses, one on each side, and usually lying above the alveolar portion of the superior maxilla in the adult, roughly reaching anteriorly to the first bicuspid and posteriorly to and beyond the third molar, and measuring one and a

half inches in height, one and one-quarter inches antero-posteriorly and one inch transversely. The maxillary sinus is small at birth, for in it are stored the teeth and germs of teeth which are to erupt as the child grows. (Fig. IV.) The alveolar portion of the maxilla is in contact with the orbital plate. With the eruption of all the teeth the antrum has reached a fair size but the walls are yet rather thick. Adult life having been reached, the bone is gradually

FIGURE V.



From a man who had passed middle age. The anterior wall of the antrum is removed. The walls are thin and the antrum large, contrasting well with Fig. III. The string emerges from the ostium maxillare (6) at the very topmost portion of the antrum and offering, while in an erect posture, a poor opportunity for drainage. The bony covering of the frontal sinus (2) is largely removed, leaving the lining membrane of the sinus open to view. One of the anterior ethmoidal cells (3) is exposed in a similar manner. The intimate relation of these two parts is thus well shown. (5) is the infraorbital foramen. (4) is a match passing into the lachrymal duct.

absorbed from the interior, the alveolar portion remaining moderately heavy, but after middle life and with the loss of the teeth even the alveolar portion is gradually absorbed, until finally in edentulous old age we find at times the walls of the cavity reduced to the thickness of paper, its form being almost identical with the outside

form of the body of the maxilla. (Figs. II, V.) The shape of the cavity is described as sphenoidal, cuboidal and pyramidal. As a matter of fact, it has a shape unto itself and adjectives describing it fail to give an adequate conception of its form. Its inner wall is formed by the anterior wall of the corresponding nasal cavity, the roof is the floor of the orbit, its own floor the alveolar portion of the maxilla. The anterior maxillary wall is its anterior boundary. The external maxillary wall forms its external wall, and

FIGURE VI.

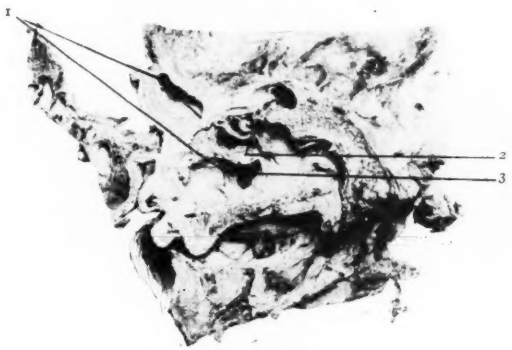
Shows the outer wall of the left nasal fossa, middle turbinal bone removed. The *ethmoidal cells* are plainly seen. (2) is the ostium maxillare much enlarged. (1) is a probe passed through the exit of the frontal sinus and directly entering the antrum. In a condition of this kind disease of the frontal sinus might be mistaken for antral trouble, as the secretions from the frontal drain directly into the antrum.

posteriorly and somewhat externally its boundary is formed chiefly by the malar process of the maxilla. The depression on its antero-external wall is called the cuspid fossa and is of surgical value. The exit of this sinus, the ostium maxillare, is situated at the superior portion of the inner wall, about midway back, and empties into the middle meatus—a poor location for drainage and in striking contrast to the drainage of the frontal sinus (Fig. V). The mucous membrane lining the accessory cavities is an exten-

sion of that from the nose. In the sinuses it is markedly ciliated, the cilia all working toward the outlet. The mucous membrane also serves as a periosteum.

Function.—The purpose of these complicated cavities is threefold: *a*—Respiratory, and *b*—Speech, in which all take part, and *c*—Smell, in which the upper portion of the nasal cavity is alone concerned. Their function in the act of respiration is to properly warm and moisten the air, the accessory cavities probably being aspirated by the passage of the air through the nasal fossæ and thus furnishing their quota of the moisture. A sudden expulsion

FIGURE VII.



Opposite side to Fig. VI.

A correspondingly large ostium maxillare (3) but with a polyp (2) overhanging the opening. The probe (1) is passed from the frontal sinus through the infundibulum, showing that the course of the exit conforms to the normal one, that is, into the middle meatus at the anterior portion. Above is the sphenoidal sinus (4).

of the air, as in the act of sneezing, aspirates these cavities. The mucous membrane of the nose also arrests many substances which would be injurious to the lungs, and are carried out by its cilia. In speech they act as resonators, giving better tones.

Etiology.—The mucous membrane of the accessory cavities being continuous with that of the nose, it is not to be wondered at that they are frequently involved by extension in the inflammatory con-

ditions of the nasal mucosa. Infectious diseases are a frequent cause of trouble in the accessory sinuses, notably the grip. The teeth, as a causative factor of trouble in the maxillary sinuses, are prominent. Authorities vary in their estimates of this source of trouble from 20 to 50 per cent. Strange to say, the lowest estimate is given by a dentist. Formerly the teeth were looked upon as being almost the only cause of trouble in the antrum, but now it is recognized not only that this is not so, but that disease in the antrum may give rise to trouble in the teeth. The three molars are

FIGURE VIII.

Anterior and superior walls of frontal sinus removed, showing on the right side the sinus divided by a bony septum into two, each having a separate exit. Probes are passed through the exits and also through the single exit of the left side.

most constantly in relation to the floor of the antrum, next in frequency are the second bicuspids and at times the first bicuspids, and infrequently the cuspid. Drainage from one sinus may involve other sinuses.

Symptoms of Inflammatory Conditions in the Accessory Sinuses. —*Acute.*—Pain is more constantly present in acute conditions than in chronic. It is usually a feeling of pressure. *Chronic.*—Pain and headache in some instances. Nasal obstructions, especially from

the presence of polypi. Tenderness upon pressure. The eyes may be disturbed by pressure. The presence of pus, either fluid or as crusts, in the nasal passages is the most constant symptom and if unilateral is strong presumptive evidence of sinus suppuration. The location of the pus in the nasal cavity and transillumination are the two chief means at our command in making diagnosis of the sinus or sinuses affected, a differential diagnosis ofttimes being a difficult matter.

Treatment.—In brief, treatment is drainage supplemented if need be by curetment of the diseased portions. In the case of the antrum drainage may be made through an alveolus, more certainly as a rule through the first molar, through the cuspid fossa, through the natural ostium, or through the inferior meatus. The author confesses a preference for the opening through the inferior meatus. The ethmoidal cells can be reached as a rule by the removal of the anterior end of the middle turbinal, and in more radical operations by continuing on through the antrum when the opening is made through the cuspid fossa. The frontal sinus may be attacked by enlarging the infundibulum or externally, preferably at the inner angle of the orbit, through the thin bony covering, the *lamina papyracea;* the sphenoidal sinus by removing the posterior end of the middle turbinal and opening through its anterior wall, or by extending the operation on the ethmoidal cells on into the sphenoidal sinuses.

GOLD INLAYS.

BY E. H. ALLEN, D.D.S., FREEPORT, ILL. READ BEFORE THE ILLINOIS STATE DENTAL SOCIETY, AT PEORIA, MAY 10-12, 1904.

In my limited experience, I find the gold inlay to be a very valuable way of preserving the tooth when the conditions indicate such a method. I may say that gold inlays are indicated in large cavities in the bicuspids and molars, provided it does not result in an undue display of gold. Teeth may be saved by a gold inlay which, if filled with gold foil or amalgam, would best be treated by crowning. This may also be said of the porcelain inlay. To make a gold inlay that will properly fit the cavity it is intended to fill requires no more skill and practice than a good gold filling requires, and no less. The cav-

ity, however, for an inlay requires an entirely different preparation than one for the gold filling. As all of you doubtless know, the cavity must have no undercuts to retain the inlay. In other words, the cavity must not in any way prevent the ready removal of the matrix. I prefer pure gold, at least No. 36, Brown & Sharp's gauge, for the matrix.

Let us now suppose that we have a cavity prepared in a molar or bicuspid, either mesial or distal. I cut a piece of pure gold plate, the thickness before stated, large enough to line the cavity with plenty of surface to extend beyond the margins in all directions. Put this piece in place over the cavity, then with a good-sized piece of spunk or wet cotton (I prefer spunk) push the gold to the bottom of the cavity; hold the gold in place by pressing upon the spunk with a broad-faced instrument, then with a burnisher work the gold against the margins of the cavity, working out any wrinkles in the gold. You now have a matrix that in a rough way conforms to the shape of the cavity. Remove and anneal, return to the cavity, place the spunk in position, then with a piece of cotton tape to hold matrix against margins of cavity burnish matrix perfectly against them. The matrix may be removed and margins trimmed to the outline of cavity, which is now plainly shown on the matrix. The matrix is now returned and refitted to cavity. It is then filled with a drop of hard, sticky wax to facilitate removal, the wax rendering it less liable to injury in handling. Matrix is then invested and when hard the investment is placed in the gas flame and heated. Let the wax burn out. 20 or 22 carat gold solder is now flowed into the cavity until the right quantity is obtained to make a proper contour of the inlay. A very ingenious yet simple way of securing adaptation of the matrix to the cavity, for the discovery of which credit is due Dr. Clinton B. Helm of Rockford, is the packing of soft gold foil into the matrix. This foil can be left in and solder flowed over it. This secures a very close adaptation. Dr. Helm also secures outline for contour and occlusion in case of occluso-approximal cavities in this way. When the matrix is in position take a piece of gold plate the same as matrix is made of, and conform it to shape as if for a simple matrix to be used to aid in inserting a filling. The top is cut so as to conform to the occlusion of upper or lower teeth, as the case may be. This is tied with ligature passing around the tooth; then the soft gold before mentioned is packed in place until proper con-

tour is secured. I do not fill this cavity entirely with the gold foil, but only enough to satisfy myself that I have proper adaptation of matrix and cavity; then I drop some melted, hard sticky wax upon the matrix. When this is hard, the ligature is cut and the entire piece is readily removed from the cavity. If care has been observed in properly adapting the part used to secure contour to the gold used as matrix, it will be found that the two parts are in actual contact. This piece then is invested, wax burned out, and filled with 22 carat solder. The heat should be applied to the under side of the investment. Thus solder will be drawn down and the inlay become one solid piece. After this, the edges should be properly trimmed to the margin of the cavity, and the inlay polished. Before cementing to place, I have roughened the surface of the inlay with a cross-cut fissure bur in order that the cement may take a firmer hold of the inlay.

Another way of using the inlay is for cases of extensive wear of the occlusal surfaces of the molars and bicuspids, when it seems desirable to lengthen the bite. I can best describe this method by telling you how I treated a case about two years ago. A gentleman about 38 years of age had teeth which were practically immune from caries, but the occlusion was such that the incisors, upper and lower, struck directly against each other. There had been considerable loss of tooth structure as a result. I concluded that if the bite were lengthened, the wear would cease as far as the incisors were concerned. I therefore cut down the occlusal surface of the right inferior second molar to insure a flat surface and also to enable me to get a cusp of gold plate that would lengthen the bite enough to relieve the incisors. I then burnished and fitted 24 carat gold plate, about 36 gauge, over the flat top of the molar, leaving the edges flush. Then I drilled holes in each corner of the crown, perhaps 1-12 to 1-16 inch deep, diameter large enough to take a 20 gauge iridio-platinum wire, square wire preferred; then placing the cap of gold back in position, I found the location of the holes with a burnisher, punched holes through the plate, and drove the posts through, which had been cut to the requisite length. Then flowed sticky wax over the top and cooled; removed and invested in wet asbestos and soldered posts to place. Then selected proper die for swaging the cusps for the case. 22 carat gold was used and the cusps filled with 22 carat solder. Placed the cap with posts soldered in position back on the tooth;

then tried the cusps; if too thick to give the desired length, it was readily adjusted with a file. When the proper adjustment was secured placed hot sticky wax on the under side of the cusp and when cool enough not to run, placed on the gold cap which was in position on the tooth and directed the patient to bite. This placed cusps and caps in the proper relation to each other; removed this from the tooth as one piece, built wax over the edges where the solder was to flow, and invested; then heated up and filled the space between cap and cusps with 22 carat solder, finished and cemented in place. Next I took the left inferior second molar and treated the same way, then the first molars and bicuspids, until I had lengthened the bite as much as desired. An excellent occlusion was in this way secured. I think I never performed a service for any patient who was better pleased and had as much comfort from the operation. All of these cusps are in position just as they were when cemented in place.

CAVITY PREPARATION FOR PORCELAIN FILLINGS.

BY W. T. REEVES, D. D. S., CHICAGO. READ BEFORE THE NEBRASKA STATE DENTAL SOCIETY, MAY, 1904.

In cavity preparation for porcelain inlays we are presenting a new line of work that has been very little written on—largely, I think, for the reason that it is hard to convey any adequate conception of the work without it being profusely illustrated, or with the aid of models. The use of porcelain for fillings entails cavity preparation entirely different from anything heretofore used. The orifice of the cavity has to be larger than the interior, so that whatever form of matrix is used and burnished into the cavity can be withdrawn if it is not all that is necessary. There are a good many other features that are essentially exclusive to porcelain for filling material. I have given seven conditions that should be followed in every cavity.

First, all decay removed. That should be a condition in all classes of work. There are a very few places where it might be permissible that a little of the decay be left, but for a general principle, all decay removed.

Second, margins extended to glistening enamel. In the use of porcelain we have a condition that is different from any other

material. The surface of the porcelain brings protection to the adjoining tooth surface, and consequently it is not necessary to make extensions for prevention, on the principle that we do when we employ gold, amalgam and cement as the filling material. A good glistening enamel margin should be cut until you reach good glistening enamel. That is a matter to be determined by the operator, whether much cutting should be done in the filling of the tooth; the extension of the margin is sufficient to give all that is necessary in that connection, as compared with the extension for prevention.

Divergence from parallel lines. A great many in writing on the subject of porcelain for filling are advocating the formation of cavity in the way of parallel walls. In one respect it would add something in the matter of retention, but it complicates in several ways, so that we lose more than we gain. Having a cavity that had parallel walls would necessitate, in the accurate fitting of such cavity, to work from an impression and form a matrix on the outside of that impression, so that whatever was baked into the matrix would be as large as the cavity. One of the points that is made in connection with burnishing direct into the cavity is that the matrix would be eliminated.

The diagram is intended to show a cavity that would have parallel walls. Whatever was baked into that cavity, or whatever was burnished into it (this line illustrates the thickness of the material), when the matrix was stripped off, would lack in diameter that thickness of the material on both sides; in depth it would fill the cavity, because the material extends over the surface of the tooth to the same extent that it takes up at the bottom of the cavity, but in diameter it would lack the thickness of the material. If we just reach over the parallel walls, then we have a cavity that the material which is burnished in there will leave an opening as wide as that in the cavity, and then the porcelain baked into the matrix will set into the cavity as a wedge would set into any place, and in that way practically eliminate the thickness of the matrix.

The undercuts are obliterated in what we have to-day, because if we had undercuts they would prevent the withdrawal of the matrix without distorting it or warping it, so that whatever was baked into the matrix would not fit the cavity. Go to another of the

models and we will speak of the different ways in which such undercuts can be obliterated. Margins beveled to a knife edge with the outer surface of the teeth, and in that connection I have a little drawing here to illustrate the principle. If a joiner were making a joint of a plank or any piece of timber, and it were sawed square in that way, then the joint would be what I call a butt-end joint; but if I wanted to make a very close joint I would saw that so it would make a lap joint, and in that way I could make a joint that would take a great deal less space than one that had a butt-end joint. Now we want to do the same in preparing our cavities, so that when the inlay goes into the cavity it goes in on the principle of a lap-joint instead of a butt-end joint. In that connection I have three diagrams, this representing one tooth and this another, copied the best I could from articles that appeared within this year in the magazines. In both cases they represent what would be a butt-end joint, this representing here the thickness of the enamel, and then the pressing into the cavity, so that when it is fitted in there we have a square seat at the top, and in both places it would amount to a butt-end joint. This is a flat surface, and that at right angles to it, making both of these what would be a butt-end joint. In this lower one I have tried to represent the formation, whatever shape we want to give it, as far as the formation of the labial surface is concerned. However, in looking at that cavity from the other view we would have the margins sloping in from the outer surface of the tooth, and in that way we would have what would be the same as a lap-joint in the illustration, as a joiner would make a joint.

Seat-formation for frictional retention. Both of these cavities have seat-formation for frictional retention, and that would be what is termed a saucer-shape in the cavity, and would then give seat-formation for frictional retention.

Seat-formation for setting purposes. An inlay to be in its place, if it were in a strictly saucer-shaped cavity, when the cement is put into the cavity it is very easy to slide a little out of place; one margin may be very slightly depressed, another one will be correspondingly raised, and in that case all portions of your inlay are just a little out of adaptation to what the matrix was, part of it would set and part of it would be out of

position. Now some formation in the cavity that will very nearly insure the inlay going absolutely to place will bring every part of it into its proper position and give us the adaptation which I believe is the secret of the success of their retention.

We will start with this cavity on the labial surface, and when that would occur on all the teeth at contact-point—that is, contact-point cavities in any of the teeth, anterior or posterior, cavities which in their inception are very simple, a No. 3 or 4 round bur would remove all the decay and carry us to good, sound tooth-tissue, and we would have a strictly saucer-shaped cavity. Now we wish to avoid that for the purpose of retentive form and also because of its being set in its proper position. To do that the use of the small bur around the floor, run around the cavity, would flatten that floor, and it would be but a very little cutting that it would have to do. In doing that flattening it is well to do it in a form that will make an identifying form of inlay, because while we have a matrix on an inlay of this nature, oval or round, it is easily identified—our matrix gives us the shape of the teeth and the same impression, but when the matrix is stripped off there are a great many of them that you could not tell apart, and they are hard to detect when you have to set it into the tooth; but if, in flattening the floor for frictional retention form and also for form for setting purposes, you will make one end a little wider than the other, then the inlay can go only into the position in which it was burnished. If it is hard to identify as to color, and you have made no variation, which would be at the cervical portion toward the cutting edge, after you have stripped the matrix off and put it in the cavity previous to putting the cement in, if you will take your pen and put a spot of ink on the outer surface of the inlay, far enough away from the margin that the ink will not run underneath and remain on the inside of inlay, you can then set that on the table, and when you come to set it you can pick it up with an absolute certainty that you know just which position it has to go in without looking at the inside to detect the little difference in its position.

In regard to finishing the margins to a knife edge, one of the best ways that you can determine that is by the position the bur or stone is occupying in cutting. If cutting with the diameter

of the bur at the margin, then the slope has to be so that no undercut will be made; but if you are cutting so that the diameter is below the margin, the chances are you may get a little undercut, and there are lots of positions in the mouth where it would be hard to detect that little difference.

Next to that class of cavities would come those in the contact point that have developed to a little larger extent, particularly in the anterior teeth. Some of them may have been filled with gold and require refilling, which makes large cavities. Remove the decay and come to the glistening enamel, and then, in the seat-formation of such a cavity, make it of a triangular formation, the base of the triangle gumwards. I consider that a cavity of that class, the larger its extent, to be the easiest inlay for anyone to begin on. The cavity that is shown on the labial surface here is one of the most difficult cavities to fill, and this is one of the easiest for anyone to begin on.

Now those cavities that occur in the approximal surface, that have extended to the point of encroaching upon or weakening the corner of the tooth, the cutting edge, to such an extent that if you were to fill that cavity with gold it would be necessary to cut that corner off, if there is any dentin remaining between the plates of enamel it is perfectly safe to leave a corner of that kind and fill it with an inlay, because the inlay will restore that tooth practically to the strength it had previous to any decay encroaching upon it. If decay has removed a portion or all of the dentin remaining between the plates of enamel, then the operator must decide whether such places filled in with a little cement will still leave them strong enough. In the majority of cases it will still remain strong enough. If you have dentin between these plates it is perfectly safe to fill such cavities with an inlay, but with any other material it would be necessary to cut off the corner and make a cutting-edge cavity. I have been asked, "Why not cut the corner right down as you do for a gold filling?" The reason is this, that it is a very small cavity to fill when you have a corner remaining, but if you are restoring the corner you have a contour to build out that takes more time, and you will finish one in much less time and will be perfectly safe in this case. Now that will apply particularly to laterals where the corner runs off diagonally in the majority of cases when it is encroaching upon the cutting

edge of the tooth. Next to this would come cavities that involve more or less of the cutting edge. In all this class of cavities, the floor at the cervical margin, you would at least cut it so that it would be parallel with the line of the cutting edge, giving that much of a shoulder at the cervical portion. In the majority of cases your cavity will shape up so that you will have more than that. The only other feature in connection with these cavities, on general principles, is the preparation of the cutting edge; instead of making the cutting edge flat, as a stone or a disc would cut it, if this is round, as you could cut with the Arkansas stone, and about a quarter of the distance from the cutting edge to the gum; then from that point make a triangular formation for setting purposes. An inlay made for such a cavity, the more it is wedged the tighter it will go to its correct position, and the better the result.

In many cases that have gold fillings, where the filling has been cut across the cutting edge for anchorage, the labial plate on the enamel will frequently break; if it were to be refilled with a gold filling we would of necessity have to cut a straight or a perfectly curved line, and remove the enamel and dentin at this portion of the tooth. If we were to fill with porcelain and cut in that manner we would have at this point a very attenuated portion of porcelain; it would be very brittle, and in the fusing of the inlay would undoubtedly break at that portion. For the purpose of getting the porcelain of strength we would have to cut up here a little.

Now, in the matching of colors, which we do when we match porcelain to the teeth, we can take advantage of the fact that a curved line is deceiving to the eye, and a joint would be much less conspicuous than a straight line. We can join right into the lines of the cavity on two curves, curving at this corner, and curving there a joint to hold the curve or make the old curve true again. We also have the additional advantage of the shoulder formation, the frictional retention throughout, and in a great many cases, where it is not broken, but where we can leave a curved line in the formation, it is being followed very largely on account of the chance of its deceiving the eye. In connection with that, if the cavity is of this nature, and that is not very frequent, a depression cut at this point that the matrix is burnished into, and then the resultant baking will leave a little bit of porcelain to fill

that depression, will give a great deal stronger retention than any pins that you can bake into the cutting edge of inlays and have the corresponding hole cut into the tooth for such pins to set into.

In taking up the cavities occurring in molars and bicuspids, practically one description will cover all cases of that kind, in great and small, in a cavity that is directly at the contact point, and as they occur in the occlusal surface of molars and bicuspids, the decay will progress either labially or lingually in one direction. Now, instead of being necessary to cut at the opposite side to the extent you would in filling with other materials, you can shape up your cavity as it has naturally decayed.

A cavity which is broader at the cervical margin than it is at the occlusal corners has been frequently cited as being impossible to fill with procelain, whereas you can easily tuck the gold around at these corners and fill with gold. Now it is only a matter of a little more separation for that class of cavity, and the separation can be accomplished with the use of caps, afterwards packing gutta-percha and allowing the patient to go for a few weeks, and then an inlay can be made which will pass up in the space and even set into the cavity. That is where we have the extremely heavy corners, at the occlusal, and do not wish to cut them away, where the decay is at the occlusal corners. If there is any undermining of these corners, if there is decay, however slight, cut the corners away and shape it in such a manner that you have a cavity that the matrix would withdraw upwards and practically require no space. If you have the full space that the tooth would occupy, if your filling can be made to go in here and you need no space for finishing, and if the bicuspid on the opposite side has not been involved, there is no possibility or probability of its being so, the age of the patient and these things being taken into consideration, I would cut such cavity out and fill with a simple gold filling. It can be cut with a No. 2 or 3 round bur and filled with gold very quickly; then shape up the cavity on the approximal surfaces as though there were nothing in connection with the sulci of the tooth to consider at all; but if the pit opposite is involved and decayed, or decay has started, then cut it out completely and make the inlay to carry across and fill the opposite pit.

If there are two inlays on the approximal surface of bicuspids, carry the inlay far enough that when you shape up the opposite

cavity you can cut against your inlay and shape the second cavity as though that were all there was to consider in connection with that tooth, making the joint in the center against the inlay the same as you would against the tooth.

In connection with cavities at the cervical portion of all teeth, frequently the cavity will extend beyond the enamel; we will cut and reach good glistening enamel at this point, but the dentin is decayed beyond. Now if we were to fill this with gold it would be necessary to cut that higher so that we have no thin plate of enamel there, because the packing of the gold in such a cavity would very likely break that plate of enamel away; but for inlays, when you have reached good glistening enamel, so that you have good tooth substance, then you can fill in behind that with a little cement and shape your cavity as though it were good dentin that you were working on. You would not endanger that part of the tooth, and the inlay makes it perfectly safe.

One other class of cavities—those occurring on the labial surfaces, where most of the cavity is upon the roof portion of the tooth, where in the majority of cases it is considered necessary to pack such a cavity with gutta-percha in order to force the gum out of the way. In handling that class of cavities I do not pack to force the gum tissue out of the way, because in most all cases gum tissue packed away from a cavity in that manner does not come down and cover the filling as it should; but in order to avoid hurting the gum such cavities can be made with a small gem-stone that is used for cavity cutting. You can obviate the coming of the diameter up to the margin, because then you would lacerate the gum, but cutting into the cavity you can remove all decay and get margins that are sufficiently good at these points; but in that kind of cutting it will result in an undercut which will not do any harm, for the reason that the inlay will start from this end and reach up into the undercut and down into the cavity. Now the burnishing of the matrix for that class of cavity can be accomplished very nicely by burnishing from this end and simply forcing the gum gradually back by pressure ahead of the platinum, numbing the gum as you push up, and in that way accomplishing it with comparatively little pain to the patient.

COMPRESSED AIR IN DENTISTRY.

BY GEORGE ZEDERBAUM, D. D. S., CHARLOTTE, MICH. READ BEFORE THE MICHIGAN STATE DENTAL ASSOCIATION, AT LANSING, JUNE 28-29, 1904.

It is my purpose to bring before you the many advantageous uses of compressed air in the practice of dentistry. We shall first consider the apparatus necessary to obtain and maintain a certain pressure of compressed air. In my opinion the best apparatus is the one described and illustrated by Dr. H. C. Register of Philadelphia in the April number of the *Brief*. It consists of a small pump which operates by being connected by a pulley to an electric motor. When the motor is set in motion the pump compresses the air into a storage tank which, by means of an air gauge, accurately registers the pressure of air stored. From the storage tank leads the outlet pipe guarded by a suitable valve. Unfortunately the use of this outfit is limited to those who are located where a street electric current is obtainable. The other apparatus which we all can have is the one depending upon the water supply, and this is available in almost all towns. No very high pressure is necessary. Here we have an "air pump which is attached to the city water-supply pipe, and which keeps a desired pressure of air in the storage tank automatically." A small pump, such as I just described, will maintain from thirty to forty pounds pressure of air for a long period. The manufacturers of these pumps claim that only one pound of pressure is lost by friction, that is, your compressed-air tank when kept full will register just one pound less than your water supply registers. The temperature of air so obtained is about twenty-five degrees Fahrenheit higher than that of the water at the same time. Either apparatus described may be had for some twenty-five or thirty dollars. They occupy but little room, and in case of water-motor and tank, these can be stored in the cellar and air piped up to the most convenient point. There are many other outfits on the market, some with hand and others with foot pumps, but I have the same objections to these that I have to a common rubber-bulb atomizer, namely, insufficient capacity and insufficient pressure of air for prolonged use.

To prove that compressed air is becoming more and more a necessity for us and not merely a luxury, as many may suggest,

one has only to look into some of our dental publications. A number of thinking practitioners are considering the installation of compressed-air outfits in their offices, and many have them. Only the other day I read an advertisement of a modern dental office for sale; everything complete, electric engine, lathe, compressed-air outfit, etc. This is my sentiment exactly. No office is complete and up-to-date in every sense of the word without its compressed-air supply.

Now let us consider the many varied uses for this air. I will suggest only those that I have had experience with during the last two years. There may be many more advantageous uses for it, but I leave them for others to demonstrate. All I wish is to show its value to us, whether it be for the laboratory, the operating room, or the extracting room.

Preparing and filling sensitive cavities with plastic filling materials becomes an easy task when the cavity is thoroughly dry, and a stream of compressed air will dry the cavity and enable the operator to do better and quicker work. Take a large buccal cavity in a lower molar, involving the middle and gingival thirds occluso-gingivally and the middle-third mesio-distally. Such is by no means easy to fill as it should be filled, especially in cases where one has to do it without the rubber dam. Such submarine fillings are never satisfactory. A current of air applied for two minutes will in most mouths entirely dry the seat of operation, and after the filling is inserted it will require some effort on the part of the patient to bring about the normal moisture.

In preparing all cavities we are obliged to stop frequently and blow out the chips obscuring the point of operation, and not infrequently do our patients complain of the heat generated by a rapidly-revolving bur. Take a small rubber tube, the diameter of the opening of which need not be over one thirty-second of an inch, and wire it around the engine cable down to the point of the handpiece, then turn on the air pressure and go ahead with the drilling. The current of air will not only keep the point of operation in constant sight and free from chips, but will also prevent the bur from heating and thereby lessen the pain and duration of operation. Nowadays we are after means calculated to lessen the degree and amount of pain, and toward doing work with expediency, and for this purpose alone the compressed air is

valuable. Should it be desired to heat the air before it reaches the cavity, that also is easily accomplished, for all that is necessary is to state our needs and wants, and there are many ingenious minds among us to devise such instruments and accessories as may be needed and are not yet in the market.

In taking impressions and bites in wax or in gutta-percha or in various modeling compounds requiring heat for their plasticity, all one has to do after their introduction into the mouth is to turn on the compressed air and cool off the mass in a minute. You will have a sharper impression or bite as the result, and the patient will not get tired and spoil the impression by involuntarily closing the mouth or changing the relative position of the jaws in case of bite. Again, you are saving time, and the trouble of preparing another "hot cake" is obviated.

In treatment of empyema of the maxillary sinuses, or of a wound after a root incision, or of any other injury about the mouth, where the parts to be treated are remote from sight and easy reach of the operator, and where a thorough medication is required, whether it be of a liquid or of a powder nature, here again the best mode of application is easily solved. If it be a liquid a pointed atomizer tube will, by means of gentle but steady pressure of air, do the work more effectively than when applied by old methods. If it be some powder medicament, I use a glass pipet into which I gather a few pinches of this powder; the free end of this pipet is attached to the air valve and the opposite end is inserted just at the opening of the wound. Then turn on the air and it does the rest. The powder will be distributed all over the wound more uniformly, and the deepest portions being reached will quickly stimulate healthy granulations. These deepest portions as a rule are slighted owing to inaccessibility of the parts, but here the force can be exerted as the case may require.

In treating pyorrhea in all its varieties and stages, and in many diseases of the pericementum, one saves much time and effects a permanent cure considerably quicker by the use of a compressed-air atomizer, treating the diseased parts directly by daily spraying with proper medicaments. Marshall, in his work on "Operative Dentistry," suggests the use of atomizers for this purpose. Here again the compressed-air apparatus enables one to send uninterrupted streams as strong or as weak as the case in hand may

demand into the deep tissues, and down into pus pockets where it is most needed.

To deodorize malodorous mouths before commencing an operation is a desirable feature beyond dispute, and here again comes the valuable and efficient use of compressed air. While touching upon deodorization, I would remark that not infrequently our operating rooms have peculiar "dental odors" about them. Iodoform, carbolic acid, creosote, cassia, cloves and other essential oils and highly-volatile substances, all add to the office, in the mind of many sensitive patients, still more repugnancy than they already have from fear. It is my habit to spray a weak solution of spirits of lavender; fumigate, so to speak, the entire breadth and length of the operating room. Compressed air does this admirably, the room smells sweet and fresh, and the air is by far more agreeable.

How many bridges and crowns have to be reset in our practice, and all because in the majority of cases they were put on while saliva was running freely in and about the abutments? With a steady compressed-air current I can dry up the mouth so that a bridge or a crown can be set under absolutely dry conditions, thereby assuring its stability.

Have you a long soldering job? Here also attach the compressed-air hose to your blow-pipe, and the absolute ease with which the soldering can be done is surprising. Furthermore, no checking of porcelain is apt to occur when the heat, as in this case, is steadily applied.

After giving nitrous oxid or any other general anesthetic the patient is revived quickly by the application of a strong force of compressed air directed squarely toward the face. Very often patients faint at extraction, but compressed air applied as above revives them at once.

The use of local anesthetics by means of injections with the hypodermic needle is objectionable to many patients, but they will not object if you "freeze the gums" by the local abstraction of heat, directing finely-divided streams of ether or other such remedy by means of the compressed air. Here also it is by far more effective than atomizers operated by hand or foot bellows. The stream is steady, and consequently less of the drug is used and the required numbness is obtained in much less time. After extracting I often

check the hemorrhage by spraying into the alveoli some suitable styptic with the compressed-air outfit.

The problem of interesting the children, while doing some painful operation for them, is a hard one, so I often let them help me by holding the compressed-air valve and keeping the cavity blown out. They like the idea of helping you, their minds are away from the seat of trouble, and you accomplish better and quicker work with but an occasional involuntary flinch from them.

No doubt there are many more useful ways of utilizing the compressed air, once it be installed in our offices. They become apparent as one uses the apparatus and becomes acquainted with it. At first I applied it only where I wanted to prepare a difficult cavity without the use of rubber dam. Since then all the other various uses I have mentioned followed naturally, each in its respective turn. I know that but very few have ever used compressed air, and many have never thought of it. I wish all would try it and become convinced and, as I have said before, add more to the already long list of advantageous uses of compressed air in dentistry to commend its intrinsic value.

Discussion. *Dr. C. P. Wood:* I have made much use of compressed air, and can cordially endorse all that the essayist has said in relation to its valuable and varied uses. Especially is it valuable in drying the gums for setting crowns and bridges. For this purpose I use an alcoholic spray, as this produces a more thorough drying and stops the oozing of blood or serum. I remember using it once to keep out the saliva from a small puncture of dam until I had completed the filling. It is also valuable in disinfecting the mouth or preparing it for operative treatment or medication. Like many other good things it will not do everything, and it may work injury sometimes if used with excessive pressure or if the application is unduly prolonged.

Dr. A. L. LeGro, Three Rivers: I have used compressed air considerably during the past four years, and should not like to be without it in my office, as it is so generally useful. I use and like the water-motor pump, as it does not require so much attention as the electric pump. I have had no trouble or expense from my motor since putting it in four years ago. It is important that the plant be properly installed. A good water force is essential, also

a large tank, such as a forty-gallon hot-water boiler, which is used in connection with the kitchen range. This should be absolutely tight. It can be made so by pouring a gallon of asphaltum varnish into it and rolling the cylinder about until the whole interior is covered with the varnish; the excess can then be drained out, and when the varnish has hardened it can be used. A proper valve should be added to control the pressure, also well-fitted and connected pipings for conducting it to the chair or bench where it is to be used. I don't find it desirable to apply cold air to sensitive dentin, and have much better success by using an electric heater in connection with the blast, as this does not irritate the tooth but has rather a desensitizing function.

Dr. Zederbaum: I wish to have you note the fact mentioned in the paper that the compressed air is from twenty-eight degrees to thirty degrees warmer than the water which pumps it. If the tank is placed in a warm room the air will of course have practically room temperature, except that if sprayed into the cavity it produces some lowering of temperature, because of the evaporation of moisture from the tooth and the current which agitates the air in the neighborhood of the tooth.

OBTUNDING DENTIN.

BY F. C. COLLINS, D. D. S., DETROIT. READ BEFORE THE MICHIGAN STATE DENTAL ASSOCIATION, AT LANSING, JUNE 28-29, 1904.

One of the serious difficulties with which the dentist has to contend is that nearly all the tissue upon which he operates is more than ordinarily sensitive. This is particularly true of the dentin whether in health or disease. It is the pain inflicted in excavating cavities that is largely responsible for the fear the patient experiences in approaching the dental chair, and that makes so great a drain on the nervous energy of the operator in his endeavor to overcome. To devise a speedy, safe and certain means of obtunding dentin has long engaged the attention of the profession, but as yet it remains one of the dental problems that have been only partially solved.

Among the simpler methods used may be mentioned the application of heat and cold, the former by projecting a current of hot

air on the exposed surface, the latter by dropping some highly volatile fluid, such as alcohol, chloroform or ether, into the cavity and allowing evaporation to take place. The depth to which either method obtunds is necessarily very limited and would require frequent repetition to be of much service.

There are certain drugs that have more or less obtunding power. Among these are the escharotics, such as carbolic acid, chromic acid, trichloracetic acid and nitrate of silver. Their action on the exposed ends of the dentinal tubules materially lessens the sensibility of the dentin to pain. A group of drugs possessing astringent properties has also been used. The most common are chlorid of zinc, tannic acid and perchlorate of gold. Either one combined with alcohol and placed in a cavity by means of a pledget of cotton some time previous to excavating renders the operation much less painful. Some of the essential oils, such as cloves and cajeput, by overstimulating the dentin act as obtundents. They have not much immediate effect, but when placed in the cavity a length of time before operating the good results produced are marked. Drugs possessing anesthetic properties are among the most useful for obtunding purposes. Aconite, atropin, camphor, chloral and cocain are the principal ones used. They have most effect where the dentin is not very compact, and this effect may be increased by means of pressure in applying them.

All the foregoing means of obtunding dentin are but partial in their action and penetrate to a limited distance. Necessarily in the excavating of carious cavities, or in trimming a tooth for the reception of a crown, they are of little value. It was only after the introduction of cataphoric appliances that it could be said we had a means of rendering dentin absolutely insensible to pain. When these appliances were first brought to the notice of the profession they were received with high favor, but in a short time a reaction set in, owing to the many failures in practical work. This was due mainly to two causes: In the first place, some of the instruments placed on the market were deficient in some important particular. Secondly, many dentists had little or no practical knowledge of the principles of electricity, and through lack of this did not take all necessary precautions in using the instrument. They were confused by the claims of rival advocates who championed the respective merits of high and low-voltage

instruments—of those with or without a milliamperemeter attached—of appliances where the patient was in shunt or in series. Unfortunately the element of cheapness entered into those outfits that had no milliamperemeter, and without that guide cataphoric medication is little better than guesswork. Some deficiency in insulating the tooth would result in absolute failure so far as obtunding the dentin was concerned, or where the insulation was perfect the current might be so great as to injure the pulp. There can be no doubt that a cataphoric apparatus run by a battery of fairly high voltage, arranged so that it may be raised or lowered, with a rheostat to regulate the flow of current, and a milliameter to measure it, will in the great majority of cases give satisfactory results. It matters little whether the patient be in series or in shunt. The time usually required to obtund dentin by cataphoresis will always be an objection, but I look forward to its return to favor and to a place in the best dental offices.

Within the past few years an apparatus, the invention of a California dentist, has met with considerable favor among the dentists of that state for its success in obtunding sensitive dentin. It acts by directing a spray or small stream of hot water into the cavity under pressure of compressed air. A small appliance is attached to the handpiece, and a rubber tube leads from this to a tank filled with compressed air. Another tube leads to an electric or other heater attached to the fountain spittoon through which a stream of water flows. The spray of heated water strikes the dentin at the point of the bur. It is claimed that this prevents any pain being felt. This method has the advantage over cataphoresis in its effect being almost immediate, but it necessitates the office being equipped with a fountain spittoon to carry away by means of the saliva ejector the water that would otherwise collect. The principle in this method seems directly opposite to that used in applying hot air. It may be that in both cases it is the heat that acts and not the drying of the dentin, as was supposed to be the case with hot air.

A more recent appliance for obtunding dentin has lately been placed on the market. It, also, is the invention of a dentist of the Pacific Coast. In principle it is not new, only in its application. Briefly described, the apparatus consists of a receptacle for holding ether. A rubber tube leads from this to an atomizer attached

to the handpiece. From the atomizer another tube leads to a tank filled with air at about twenty pounds pressure. A pledget of cotton or piece of spunk is placed in the cavity, and against this the spray is directed. After a short time the pledget is removed and the spray is allowed to enter the cavity unprotected. In from three to ten minutes the dentin is so obtunded that excavation may proceed without pain. It requires a temperature of about 46 degrees Fahrenheit to bring this about. In the use of this apparatus the only precaution necessary is to have the rubber dam placed over the nose. Those who have used this appliance report no bad after-effects to the pulp.

From the foregoing it will be seen that the problem of obtunding dentin has been practically solved. It still remains, however, to devise a method of doing the work promptly, and until this is done the use of obtunding appliances in ordinary dental offices will be limited.

Discussion. *Dr. E. T. Loeffler:* The great difficulty with almost all methods of obtunding dentin is that those which are most efficient require so much time for satisfactory results that busy or impatient dentists use expedients which make the pain bearable for the patient and feel satisfied. This has given patients the idea that painless dentistry is a myth. The essayist has noted that the great fault with cataphoresis, the most efficient obtundent, is the time consumed. The same may be said also of all methods of desiccation, for it takes time to dry out the dentin sufficiently by any process to obtain profound insensibility. We haven't time to wait for results from good methods, and yet this is one of the difficult problems and we do not give it the consideration we should.

Dr. C. H. Worboys, Albion: Last winter Dr. Runyan of South Haven demonstrated a method of obtunding the upper anterior teeth that is unique, and I have used it since on several occasions with very good results, as have a number of men. It consists in placing a pledget of cotton saturated with a ten per cent solution of cocain in the nostril of the side on which the operation is to be made, or in both nostrils if desirable. The application becomes effective in about five minutes, so that sensitive cavities may be excavated without pain to the patient. I find a three or four per

cent solution is just as effective as a stronger one and less risky. No excess should be permitted to drain back into the throat.

Dr. G. Zederbaum: I have had good results from applying a few crystals of menthol to shallow cavities, dissolving this in the cavity with a drop or two of absolute alcohol, and then throwing a steady but small stream of compressed air into the cavity until it is dry. I don't know whether the menthol acts chemically by absorption, or whether the physical evaporating of these volatile drugs produces an excessive evaporation of the tooth moisture.

Dr. C. J. Hand: I have had good results from using a solution of cocain in potassium with pressure. I do not think we should use strong cocain solutions in the nostrils, as it would be easy for an excess to flow back into the throat, where it would be dangerous to breathing.

Dr. Worboys: I do not use over a three or four per cent solution and use adrenalin chlorid with it, so that the astringent action of the adrenalin localizes the effect. There is no possibility that any can get back into the throat, as there is no excess. I have used this method for extirpating pulps with satisfactory results.

Dr. F. W. Joslin: In using cocain as Dr. Worboys suggests there is a possibility that we may so thoroughly anesthetize the apical area that we shall lose our sense guide when removing the pulp with the broach. It would be an easy matter for us to protrude the broach in some teeth into the apical space and do much injury, especially should the broach become infected and be the means of carrying the infection into this area. A troublesome alveolar abscess would surely follow.

Dr. L. P. Hall: If patients are willing to pay for the time spent in doing their work by tedious painless methods we should be willing to allow them this privilege, unless we have so many patients that we cannot spare the time. The trouble frequently is that the patients who need anesthetic treatment most are least able to pay the price. In these cases we must do our duty even if we lose time.

SUCCESS IN DENTISTRY.

BY B. HOLLY SMITH, D.D.S., BALTIMORE. READ BEFORE THE PENNSYLVANIA STATE DENTAL SOCIETY, AT WILKESBARRE, JULY 12-14, 1904.

"I have written unto you, young men, because ye are strong." When I accepted the invitation of your Dr. McFadden to read a paper before this society, it was not merely because I wanted to oblige him, but because in doing so I hoped by word or suggestion to be helpful to someone in this to me comparatively new audience. We all have our limitations, and it is sometimes painful to reflect that where we are well known our most serious as well as our most silly thoughts are as familiar as the noonday sun, or as common as the pitchy darkness of night. My hope is that in this fraction of an hour I may bring to the willing ears of some young men a serious message—at least I will try to say it seriously. It is not to be expected when one has traveled a road for years, profiting from time to time by experience, advice and suggestion, until he feels reasonably confident he is familiar with the best going, that he will hold parley with a guide younger than himself. Middle age and old age are not times for making changes, and those who would receive this message in the spirit in which it is offered must bring to their aid the strength and courage of young manhood spoken of by the Apostle.

Before considering any means of achieving success it is perhaps well to have someone say for us, "What is Success?" The definitions have been as various as the times and nationalities of the men who have answered the question, but for our purpose the one given by Dr. Gildersleeve of Johns Hopkins University perhaps most nearly reaches the mark. He says, "Success is doing what you love to do above all other things, and being well paid for doing it." We might almost think one the natural sequence of the other. The love of one's chosen work, with all its enthusiasm and painstaking effort, ought to produce an excellence which would ensure liberal payment. However this may be, it must be accepted that success in uncongenial employment is extremely rare if not out of the question. It is hard to imagine the pain and unhappiness he endures who follows the taskmaster, or the depths

of degradation and drudgery through which he wades. How must he worse than scoff at Stevenson's words: "To travel hopefully is better than to arrive, and the true success is to labor." We will assume that none who hears these remarks wears the collar or feels the tether of the time-server, but that we all strive for any vista that will show new beauty in our beloved calling, or help us more worthily to represent its ideals.

For the sake of convenience we might say in general terms that success in dental practice depends upon: 1st. Our understanding of ourselves. 2nd. A proper knowledge of and ability to procure equipment. 3rd. The correct management of a clientele. 4th. A fair conception of a sane and safe relation to our employes. 5th. Cultivation of true professional spirit.

To those familiar with the daily life of a dental operator one fact must be patent—he must be a gentleman if he is to succeed—whether he is of polite birth or not a gentleman he must be. The general practitioner of medicine may be rough and uncouth in his personal appearance, and yet because of his great learning may bring healing and comfort to the sickbed. The patient in extremis may long for the sound of his characteristic bluster and the taste of his nauseous doses. Not so with our specialist, for his patient usually comes to him in fairly good general health, with all the senses alert to be gratified by the fastidiously neat appearance and courteous treatment of the operator, or shocked and repelled by the lack of them. True, a few may be found of mercenary trend, who will submit to the humiliation of spending an hour with a ruffian or a sloven because they get the worth of their money in good and permanent dental work, but they are exceptions. The dentist must be clean both in person and thought. The mind of the vulgarian and brute is pictured forth in his countenance, while angel forms are not more pleasing than the sometimes homely features of a true gentleman illumined by the influence of clean living and thinking.

The dentist must be honest, and it is most pleasing to me to be able to say we rarely find him otherwise. Somehow the very helplessness and dependence of the patient stimulate all the better qualities of his humane nature, and help to bring about this most to be desired condition. What though the cultivation of this side

of our nature does make many of us poor business men, our holy mission is the alleviation of suffering and the upbuilding of our calling. The unselfish mind of the professional man plays no unimportant part also in leavening the sordid grasping commercialism of to-day. Long may it be so.

The successful dentist must have a cheerful, hopeful disposition. Who that loves a smile would not go a square out of his way to avoid a long-visaged pessimist. He need not drivel nor let his cheerfulness have vent in vulgar commonplaces. Let him wake every morning with some fine thought in his mind. There is no time in the business day for long discussions, but some happy quotation, some brief optimistic comment, some ray of sunshine from a great mind, will almost unfailingly lift a sufferer out of the slough of despond and send him on his way, if not rejoicing, at least in a more cheerful mood, and very appreciative of the source of his cheerfulness.

In the matter of equipment there is opportunity for fine discrimination. The average dentist buys too many useless instruments. Untried and impracticable machinery and instruments are foisted upon us as essential, when they are often worse than useless. They begin by demoralizing our methods of practice, and end by putting us in debt to the dealer for cumbrous lumber. When an operator of recognized ability demonstrates the usefulness of an instrument and proves that it is essential, buy it at any price, but when some unsuccessful and unpractical bore approaches you with a pocket chinic, take him out and buy him something, tell him a good story, and hurry on to your next engagement and more congenial companion. Be civil, but remember that "Art is long and time is fleeting." The successful dentist owes it to himself and his patients to see the pet instruments of all the celebrated practitioners of his specialty. He may not use them with such facility as the owners, but to know their use will broaden his practice and perhaps help him out of some extremity.

The widespread information of our patients as to hospital procedure, and the teaching of physicians and surgeons as to the need of asepsis, make it necessary for the dentist in the presence of his patient to pursue some careful method of rendering his instruments aseptic. He works in a field, to be sure, where infection is rare, and mostly in tissues where it is impossible, but

patients do not know this and physicians do not recognize it. Too long dentists have been supposed to be careless as to any necessity of a sterile field of operations and aseptic instruments. We owe it to the fair name of our specialty that we should "out-Herod Herod" in our efforts at cleanliness. Formalin baths for instruments, sterilized glass tops for Allen tables, thorough and palpable efforts to put only absolutely clean instruments in the mouth, making it impossible by our arrangements for this rule to be violated—these are not advertising methods, but simply compliance with a well-known and growing demand.

The successful practitioner of dentistry must not be narrow in his methods; indeed, he cannot be stationary or fixed in aught save the general principles of practice. Who that began the practice of dentistry twenty years ago has not received from his fellows training in manipulation and use of materials unknown when he started, or whose method of operating has not been modified and improved by witnessing demonstrations by specialists of skill, who have brought these materials and methods to a state of comparative perfection? Notwithstanding this, practitioners of some reputation continue to deny their patients the benefits of porcelain inlays and bridgework, and some there are who even ignore the important teaching in regard to the proximate relation of the teeth. There is no room for prejudice or bigotry. Liberal consideration of the views of others, and a desire to keep our windows open toward the light, should be the attitude of mind.

In the management of a clientele it is a most grateful fact that for many of those who seek our services we have only to be our best selves and do our best work. It is perhaps, however, a reflection on our race and age, that this is not sufficient for all occasions. The average practitioner knows that many deviations from this ordinary procedure are essential to successfully treat some patients. In our highly developed civilization there have grown to be a large number of people suffering from unrest, or over-tension of the nerves; nervous and excitable persons who because of their condition are most exacting as to all the minor niceties of attention and personal protection from all possible disagreeable impressions. These patients lack self-control; they are frequently adrift without a rudder, disturbed, distrustful and despairing they come. A safe and hopeful refuge will more than comfort them.

To gain success with this class (sometimes the most important

and profitable patients) it is necessary for the dentist, first, by his gracious and considerate treatment to win their confidence. Second, by a self-poise born of his ability to help he must disperse demoralization; must take charge of the patient just as completely as one would take into his arms a helpless babe, and though it tax all his resources, make him comfortable and confident of complete restoration. The trial involves not simply a physical but a mental effort, and no success may be expected from an assumption of spurious strength. If deception or false hope lurks in your mind you are no longer helpful. If the consolation you offer is not from the heart it will reach no further than the finger tips. If you really assume to do service for the nervous, dispel their fears by your strong, hopeful presence, by your confidence, born of the knowledge of your power to help, and by your absolute command of their entire will power. The more familiar you are with the laws of suggestion the more effective will be your effort.

The hours at the dental chair are too few and human endurance is too limited to allow the operator to see many patients, or charge on his day book much for his daily services. There is therefore in the office of the dentist who respectfully but firmly controls his clientele, not only an opportunity but a necessity for the employment of assistants. If well-trained they will relieve him of much of the drudgery of the day, and give time for more of the major operations, and closer study of conditions which are difficult of relief. I have no patience with the statement, "I cannot use an assistant, my patients will not have him." The man who says this never really controlled his patients, and they do not properly respect him, however flattering the opposite view may be. I do not mean that these patients should be given over entirely into the hands of the assistant, but that under the advice and supervision of the chief they should receive from him certain specific treatment. The dentist himself should always maintain the position of being in charge of each case. Under the advice and control of the chief very satisfactory services may be rendered by the assistant, and perhaps new attachments formed, but no practitioner should employ an assistant without considering the possibility of future loss of patients by this means, and taking proper methods of self-protection. Assistants are not employed for the purpose of being introduced to a dental practice. Unless the

practitioner expects to make him a partner, every assistant should therefore give a satisfactory bond that he will not practice within such a radius as will allow him to take advantage of his opportunities to work for his employer's patients. With this point established, no courtesy that it is possible to extend to an equal should be denied the assistant. Don't think of him as "Jim" or "John," but as "Doctor." The young prophet must not lack honor because of your treatment.

Not less important is the careful selection of a young woman as assistant at the chair and in the office. It is not fair to your patient that he should wait while you answer the telephone or interview book agents.

No man ever dropped his instruments to hear of the marvelous discoveries which scientists have made for the betterment of human conditions, but himself longed to put his shoulder to the wheel. The professional spirit is all in sympathy with such work. Our dental gatherings attest the fact that those who have not of themselves accomplished any work of this kind are yet anxious to hear about it. It cannot be denied that the isolated few have been content to revolve in the narrow circle of their own practice, satisfied with the sparse knowledge and limited methods obtained at the time of their graduation. A certain measure of success has been attained by some of these, because of social recognition or special qualities, but no true success attends such. The small soul, who can at best claim only self-decency, cannot compete with the heroic spirit who has been willing to make of himself a human bridge over which his fellows have passed to safety.

Sacrifices for principle and human advancement bring honor, the hearty love and regard of our professional brothers, and the "Well done, thou good and faithful servant" of the community at large. No man can be respected in any condition of life who ignores his family and social obligations, and the obligations of the professional life should be almost as binding. He who ignores the gatherings and refuses to mingle with the men of his cult, will not measure up to the required professional standard of today. To have lived a life of honest service to one's clients may deserve a doff of the hat from those who are left when one passes away, but to close a life with no greater sense of loss among the members of one's calling is sad indeed. We are debtor to all who

have written and demonstrated, and the selfish soul who imagines all that is published is his because of the subscription price he pays to the publisher is worse than thankless.

Then, too, we confront a condition where patients seek expert advice of a dentist of ability, and if one is a recluse, what chance has his professional brother to pass an opinion on his ability? Association made dentistry what it is to-day. Long years of excellent practice by individuals failed to uplift or place dental practice on any professional ground. When one graduates to-day he has a heritage of liberal communications from the learned and skillful, and he is worse than an ingrate if he turns a deaf ear or refuses to lend his effort to the propagation of truth and the extension of knowledge. Dental association means more than this high privilege. The frequent mingling of those engaged in the same calling tends by an interchange of views to uplift one's conception of his responsibilities. He learns to appreciate himself best who measures his skill with his fellows. He approaches his work more sanely who compares his methods with those commonly accepted and approved.

In conclusion I desire to quote one more definition of success, given by Dr. Osler. He says, "Success is to get what you want, and be satisfied with it after you get it."

If a dental practice be conducted upon the lines I have tried to outline, I fail to conceive of any employment which will prove more grateful and enjoyable. As the master builder views with delight the graceful proportions of the completed structure, and, not unmindful of the peace and contentment of the house beautiful, gathers pleasure from his contribution to such possibilities, so must he who at the chair dispenses comfort and beauty not only take pleasure in the plaudits of his patients and fellows, but nurse in himself the greatest source of human comfort—the thought of duty well done. This is success.

Discussion. *Dr. W. H. Arthur,* Pittsburg: While listening to the paper it occurred to me that the thing most necessary for success would be a good foundation. The young men of to-day have a better chance of success than many of us who are older in practice, because they are better grounded in the elements of dentistry and have a broader foundation to build on. Those who come out of the colleges now are far better operators than those who graduated when I did. Capability also has a great deal to do

with success. Some men are more able than others, and the more ability a man has the greater will be the measure of his success. Many young men hesitate to take up new lines of practice because they don't feel capable of doing the work. A great deal depends upon earnestness of purpose and determination to perform every operation to the very best of our ability. I cannot agree with that man who defined success as getting what you want and being satisfied with it, for when we are satisfied with a thing we lose ambition and cease to progress, and progress is always necessary to success. One of the things most necessary to bring success to dental practice is attendance upon professional meetings. A man cannot go without learning something, and he cannot stay away without falling behind his fellows. The same might be said about reading the journals, for any man who neglects the literature of his profession loses one of the main elements of success.

Dr. Joseph Head, Philadelphia: Dr. Smith is a good example of one of the greatest points of success, for he has learned to love his fellow men and his fellow men love him. I would take exception to only one point in the paper, namely, that about assistants. Assistants can be trained so as to be a great help to us, but I wish to raise my personal protest against the peculiar class known as dental nurses. As professional men we must be very careful that there shall be no encroachment on our professional grounds. The operation of cleaning the teeth is now recognized as one of the most difficult in practice. In nine cases out of ten pyorrhea can be cured by careful surgical operations, and the teeth will become firm if the pockets are kept sterile. However, many failures result in the hands of experienced practitioners, so I strongly protest against this difficult and important work of cleaning the teeth ever being given into the hands of the so-called dental nurse.

Dr. H. C. Register, Philadelphia: Professional success is embodied under two heads: First, the acquirement and ethical use of facts as applied to practice, and second, a full appreciation of the value of such services. To realize success in its true sense one should love his profession and his heart should be in his work. His services should always have a professional value and never a money consideration. This means earnest work, and earnestness means success. We see men succeeding and wonder why success is given them in such measure, but if looked into we always find that the individual who is successful is honest in his endeavor.

Digests.

PATHOLOGICAL RELATIONS BETWEEN DISEASES OF THE TEETH AND OF THE EYE, ARISING FROM RHEUMATISM AND GOUT. By Edward S. Peck, M. D., New York. Read before the New York Odontological Society, Oct. 18, 1904. When one searches the authoritative literature in both dentistry and ophthalmology one is impressed with the paucity of material bearing directly on this topic. Contributions on dental and ocular disease in this field are not large, whereas contributions on syphilitic, scrofulous, rachitic, tuberculous, and cancerous disease of both teeth and eye are abundant. The larger issues of literature are from German and American collaborators, whereas England and the strictly English races furnish by far the greatest amount of rheumatism and gout, not only of the teeth and eye, but of other tissues of the body known to be the special habitat of these deposits.

In one brief sentence it may be said that these deposits of rheumatic and gouty poison find their way by selection to the fibrous tissues. So far as the teeth are involved, these poisons are deposited on those situated nearest the median plane of the mouth—chiefly the incisors—a pathological fact due to the larger amount of lymphatic and specially secreting glands in the labial and central buccal regions. As to the eye, an organ of more delicate and even more sensitive nervous morphology, not only the hard external covering of the white sclerotic coat and the tough transparent cornea in front, but also the delicate optic nerve, retina, and chorioid at the back of the organ, as well as the very sensitive iris and ciliary body near its center, are the preeminent seats of deposit of rheumatic and gouty poison.

An intelligent study of rheumatism as a factor in disease of the parts here associated demands a brief study of rheumatism itself. The very name is from our conception a gigantic misnomer. The word "rheumatism" means a condition of catarrh, a *rheum*. The term was given before Hippocrates wrote, and by him the term is called a synonym of catarrh. Long before any knowledge of lymphatic selection the ancients had conceived a species of humoral pathology—to us a pathology of humor! It was not until the

seventeenth century that its present significance was conceived, and this was by Baillou, a French physician, who also first differentiated between rheumatism and gout. Sydenham first described its migratory character from one joint to another. Cardiac affections dependent on rheumatism were not recognized till 1836. Rheumatic diseases of childhood and the subcutaneous fibrous nodules peculiar to adolescence were first carefully noted by Hirschsprung, Barlow, and others, as late as 1875.

Theories of the Pathology of Rheumatism.—Various theories of the pathology of rheumatism have been brought forward, none of which is free from objection, and none of which has met with anything like general acceptance. I merely mention them as of historic and curious scientific interest.

First: The *nervous* theory of rheumatism took rise in America, and was suggested by Dr. T. R. Mitchell, who explained all rheumatoid attacks and rheumatic involvements on the ground that the lesion was in the spinal cord. Unsatisfactory and untenable as it has been proved, such painstaking and clever students as Canstatt and Jonathan Hutchinson were its warmest advocates. The latter went so far as to maintain that a catarrhal neurosis acts as an "excitor influence" in producing true rheumatism.

Second: The *lactic acid* theory, which argued for a chemical poison in the blood due to some process of perverted nutrition. Fuller of England was its pronounced and popular advocate, though it did not originate with him. Lactic acid is a product of tissue change produced in muscle while in a state of high or prolonged activity. Profuse perspiration is the effort of the system to throw off the poison. Lactic acid cannot exist as such in the blood, as the blood is never found acid during life. Neither has any evidence been brought forward that lactic acid is in excess in the blood of rheumatic patients. On the other hand, it is well known that lactic acid, when injected into the system of man and the higher vertebrate animals, will produce all the symptoms of an acute arthritis. The well-known experiments of B. W. Richardson and Sir Walter Foster prove this.

Third: The *uric acid* theory, of which Haig is the warmest advocate. Haig bases his argument on the possibility of eliminating uric acid and urea from the blood by an extreme antacid and non-nitrogenous diet, and by the curability of both rheumatic and

gouty affections of various tissues of the body with sodium salicylate. It is to be said that uric acid is not found in the blood of rheumatic patients, nor is sodium urate found in their joints. Haig's experiments in diet and medication are most ingenious, and within certain limits his methods are efficacious.

Fourth: The *infective* or *microbic* theory of the origin of rheumatism is the one in vogue to-day. Although many of the manifestations of rheumatism cannot be explained by this theory, most of them can be. Those manifestations amenable to the microbic theory are as easily explained as are those of pleurisy, pneumonia, pyemia, and some of the infectious fevers resembling typhoid and malaria. One can, for instance, explain heredity only on the ground of an infective or microbic poison.

Haig's theory of rheumatism has received so much attention both by advocates and adversaries that a consideration of its argument is most fitting in this connection: Urea is the expression of tissue waste, and is formed from nitrogenous products derived from the blood. Uric acid is in its final stage of formation in the kidney. This is so not only in man, but in many of the birds and vertebrate animals. Uric acid, hypoxanthin and xanthin (both the latter being equivalents of uric acid) are found in all animal flesh, just as they are found in the tissues of man. Roughly speaking, meat, fish, fowl, game, and eggs contain 6 to 8 grains of uric acid to the pound. Certain vegetables, such as peas, beans and others, contain 12 to 15 grains of xanthin to the pound. Tea contains 175 grains to the pound and coffee and chocolate less, but yet a large quantity. Uric acid produces two effects on the physiology of metabolism or tissue change: first, defective combustion, when in excess; second, local irritation, when driven into the individual tissues. "Metabolism is the change in the tissues of the body which produces from the food we swallow the heat and force which we evolve." The human body is, then, nothing more than a machine to convert a certain amount of force taken from the sun and dormant in food into visible heat and energy.

Haig arrays stimulation against nutrition, not only as a process essentially different, but one eminently antagonistic to it. He styles it "merely calling out the reserves," with the result that "physiological bankruptcy must follow a prolonged course of a diet of stimulation." By stimulation is meant meat and eggs es-

sentially, then tea, coffee, etc., then alcohol, opium, and other stimulants usually in vogue as such. He argues that physical degeneration of the nation, just as physical degeneration of the individual, must follow. Evidently the cue is taken from his own nation, whose substantial diet is a stimulating one, and in which gout and rheumatism play a very high role. It is well known that England has more gout than Germany, because the English nation eats more meat by far. On the contrary, the Scotch people have little gout, due possibly to the fact that the national beverage contains little or no acid, while as a nation the Scotch eat less meat and nitrogenous food than do the English. A Scotchman living in England and eating meat and drinking wine and ale will have real English gout. As to stimulating drinks, their ability to produce gout is largely increased by the amount of meat and nitrogenous food ingested, uric acid being not only introduced but actually more rapidly formed in such individuals and nations. Garrod says that the least acid of all the alcoholic drinks is whisky, and perhaps the American citizen has learned to love his Scotch brother more tenderly since he learned the lack of acid in his whisky.

There are certain manifestations of rheumatic and gouty poison that should be noted here. For instance, inflammations of the fibrous tissues of both the eye and the teeth are more painful toward night, when the blood pressure and temperature are highest, and after the disturbances of digestion have had full swing during the day. Garrod says sedentary work predisposes to both diseases, especially gout. In fact, remarks Cullen, "gout seldom attacks persons employed in constant bodily labor." Gout has been called a winter disease by Sydenham, because less uric acid is excreted and more is retained during this season on account of the decreased activity of the skin. Damp and cold were regarded by Charcot as most potent factors in its causation. A laboring man has less gout than a sedentary man for the same reason—his activity keeps down the percentage of retention of uric acid, just as it keeps up the percentage of secretion from the skin. The skin therefore shows more uric acid and the blood less. Heredity implies a disposition to gout and rheumatism, while diathesis plainly asserts it. It is found mostly in domestic servants, as coachmen, cooks, among smiths, factory hands, schoolchildren, and married women. Women have less gout than men,

due to a difference in habits and environment. At the menstrual epoch women have less gout than at any time of their lives, at which time the urine is less acid. It has, however, been stated that women have more rheumatism and men more gout. As to women, two years before and two years after the menopause are the most prolific times for its assertion. Pregnancy and lactation, as also uterine affections, predispose to it. In women the most fruitful age for rheumatic affections is between the forty-fifth and fiftieth years; in men the age is between the thirtieth and thirty-fifth years, after which there is an arrest of gouty manifestations, with another outbreak between the fiftieth and fifty-fifth years of life. The factor of age has given rise to the inquiry as to whether rheumatism, and more especially gout, in its chronic or subacute forms is a specific disease at all, or whether it is an expression of the wear and tear of senility, of which it may be a prominent factor. Yet how often, in cases where the habits of the individual do not involve wear and tear of the tissues, are these expressions found, and, too, manifestly in association with uterine derangements, mental anxieties, emotional attacks, etc. Defective nutrition or dystrophic changes of the nervous and muscular systems may originate in a variety of ways, and a distinctly localized part such as the eye or certain groups of teeth may prove the habitat of such pathological change.

Let us now depart from a consideration of the strictly pathological causes which underlie the special dental and ocular diseases, and take up some of these diseases themselves. I will not attempt an elaborate description of them here, but will repeat that the poison of gout and rheumatism affects more especially the fibrous and fibro-cartilaginous tissues of each group. First, as to the teeth: Erosions on the enamel are due to an acid formed within the body and not to an external abrasion (Burchard). These occur usually in patients with a family history of rheumatism, or with a personal history of rheumatic arthritis, or chronic joint rheumatism. The by-products in urea formation and the waste products of suboxidized albumin are unquestionably the cause of the erosion of the enamel of teeth. Whatever the chemical controversy may lead to, as to the chemical relation between uric acid and urea, it is well known and undeniable that uric acid increases in amount when the oxidizing processes are below par. Uric acid cannot

exist in the blood, and urates are found depending in amount on the excess of white blood corpuscles; conditions of chloro-anemia, of leucocytosis, and of degenerative blood-changes amply illustrate this. Again, in acute explosions of gout in the full-blooded individual who overfeeds and overstimulates his system the tissues of the body become drenched with an excess of material which is unfit for physiological metabolism; the result is an excess of urates in the system. The products of such excess, of such cell waste, are of acid reaction. Systemic gout can be diagnosed through those erosions of enamel which, as is well known, occur on the labial surfaces and among the central teeth, and this where other and more pronounced clinical symptoms of general gout are not manifest.

Second: Gingivitis, or marginal gingivitis, has gout for one of its general nutritional causes; also rheumatism, pregnancy, fevers of malarial type, etc. The relation of gout and rheumatism with certain forms of gingivitis, and I might add with some other early and late forms of pericemental diseases beginning at the gum margin, is unquestioned.

Third: Pericementitis is a variety of pyorrhea alveolaris, largely local and traumatic in origin, but not infrequently associated with gout, as it may be also with tuberculosis, albuminuria, diabetes, or typhoid. Gout is not only a predisposing cause, but cases occur which illustrate also its exciting role in pericementitis. Reese, Marshall, and Peirce have clearly pointed out this association. So conspicuous is the gouty involvement that deposits are found on the lateral and labial aspects of the pericementum between the apex and the marginal border. Dental gout is strikingly shown in this disease, while similar manifestations of gout, as concretions, do not appear elsewhere in the body until after the thirtieth or fortieth year of the life of the individual, and frequently not until the fiftieth year. The category of symptoms is unique. Usually at first neuralgic pains occur nightly without any apparent reason, there being no exposure of dentin and no tenderness on percussion. Changes of heat and cold are promptly noticed, and the pulp becomes sensitive. Dental and maxillary reflexes begin to assert themselves, a slight recession of the gums is seen and general soreness follows, while not until a much later period dentoliths and calculi will be found high up on the tooth.

Frequently a true gouty pericementitis goes on without the formation of a calculus, or even of caries.

There is perhaps no process in dental pathology so dependent upon or so associated with gout as certain forms of pericementitis. Does not the formation of the pericementum and the alveolus furnish a true analogue of a joint, with all the elements of fibrous and fibro-cartilaginous structures? We must not forget that the pericementum is anatomically a ligament as well as a periosteum, and that the junction at the alveolus is a joint. Hence the answer to the question why gout should attack the teeth.

I have anticipated your indulgence in this brief portrayal of the most salient forms of dental gout, leaving to your judgment the introduction of other more subtle and perhaps more interesting forms. It seems incredible that any doubt should be thrown on the causal relations of uric acid and urea in these forms of disease. The presence of urea in the blood serum, where it is fully soluble, and in the kidneys, is undeniable, but the presence of uric acid is not always demonstrable.

Degenerative changes referable to gout may be found in other parts of the body simultaneously; as, for instance, in the small joints, especially of the feet and fingers. Sometimes these changes appear as obscure affections in internal organs; as, for instance, in the heart and bloodvessels, especially in the arteries, in the lungs, stomach, liver, and kidneys. Degenerative changes due to gout occur very frequently in the eye, ear, and throat. Tissue debility usually precedes an attack, and the gouty urates first seek a non-vascular part, and where fibrous or fibro-cartilaginous tissue abounds; then irritation and inflammation are set up, or necrosis may follow. In gouty and rheumatoid degenerations tissue waste is great and tissue metabolism is below par, clogging occurs, and the equilibrium of metabolism is destroyed. The final result is an explosion of urates of sodium or magnesium or potassium.

The ocular tissues most directly involved in rheumatism and gout, taken in the route from before backward, are as follows: *The cornea* in front. This is the transparent and refractive, as well as highly fibrous and protective tunic, constituting about one-sixth of the circumference of the eyeball. The white *sclera* behind, called sometimes "the cup of the eye." This is a dense fibrous and highly protective coat representing about five-sixths of

the remaining circumference of the eyeball. The delicate *iris*, whose fibro-elastic bed forms the skeleton of an otherwise highly vascular and nervous layer, and whose function by means of its pigment cells and peculiar contracting and dilating pupil admits the proper amount of light into the interior of the eye. The *crystalline lens*, a biconvex and transparent body when not in a condition of cataract, whose function, by means of its highly convex surfaces and high transparency and its limited antero-posterior motion, is to exactly focus the rays of light upon the retina, enabling the eye to see accurately. The *retina* itself—a most delicate framework of fibro-elastic tissue, endowed with fine visual sense by means of its remarkable arrangement of nerve cells, nerve fibers, rods and cones, and its spot of exquisite visual sense located in the right optical axis of the eye. The *chorioid coat* behind the retina, with the grapelike bunches of rich bloodvessels in front, and lastly, the *optic nerve*, proceeding, as the second cranial nerve of Sœmmering's classification of twelve pairs of cranial nerves, from the inferior and lateral motor tract of the central brain tissue through the ragged foramen at the apex of the orbit directly to the posterior part of the eyeball, where it expands into the retina. In addition to these, the lacrymal passages on either side of the nose, the delicate conjunctiva in front covering the inner surfaces of the lids and the outer surface of the eyeball, and lastly, the bones of the irregularly curvilinear orbit, may be the seat of deposits of rheumatic and gouty poison.

In a paper of circumscribed limits, as this must be, it will be impossible to enter specifically into the manifestations of these diseases, for they are of very different forms of exhibition and of very different grades of inflammation. While gouty deposits may be found in all the tissues mentioned, I will specify only two habitats at this time, namely, gout in the chorioid and in the crystalline lens. The chorioid coat of the eye lies between the retina and the sclerotic. Like both of these it is subtended from the tough fibrous sheath which envelops the optic nerve, and which is an extension of the dura of the brain forward to almost the junction of the sclera and cornea in front. It is an exceedingly delicate layer or tunic of the eyeball, and its bed or groundwork consists of a very thin fibro-elastic cobweb, in which lie the two layers of bloodvessels which almost entirely feed the eye. The two layers

of bloodvessels are classified as the outer venous and the inner capillary layers, on account of the relative size of the bloodvessels contained therein. In the interstices between these nests of vessels are deposited the concrete salts of gout—degenerative processes which are not accompanied with pain nor at first with any loss of vision. After some months or years they coalesce, and form scales flat and oval in form, with a shape not unlike that of the finger-nail. What was monolith becomes gradually concretion. They cannot be removed by other than dietary and medicinal agents. In time, until an arrest of development of concretion occurs, that part of the eyeball will become hard and scaly, and will give an egg-shell resistance on percussion. The chorioid furnishes the most glaring developments of calcareous degeneration in the eye.

The crystalline lens may become the seat of gout, and as such a lime or calcareous cataract is formed. This is not true cataract, nor are all deposits upon or degenerations of the lens true cataract. I wish here to call attention to the fact that eighty or eighty-five per cent of all persons over fifty-five years of age have spots or opacities on and in the lens of the eye. When they occur in the center or nucleus of the lens a true nuclear cataract will surely follow in time. It may be within one year or it may be much later. Deposits of calcium usually form first in the cortex, or capsule, and not in the body of the lens. They may remain small and stationary for years, with very little interference with integrity of vision. If others form in after years the lens may be more or less covered with a thin shell or scale of calcareous degeneration, the only method of removal of which is by extraction of the lens. I once extracted a fully-formed white calcareous cataract in a woman of forty-two years who had well developed tophi of gout in knees and small phalangeal joints of fingers and toes. This cataract was unusually large. No inflammatory process attaches to these degenerations, such as occurs in gouty attacks of the iris or retina and in some of the other tissues of the eye.

It is not within the scope of this paper, but it is eminently pertinent that some methods of treatment should be emphasized here for the relief of these dental and ocular conditions. These forms of gout in both tooth and eye are to be treated by two methods, local and constitutional. I will omit all detail as to local methods

in each location. Constitutional methods of treatment comprise those ranged under the heads of diet and medicine. As to diet, the invariable rule should be to cut off all foods rich in uric acid and which are unnecessary to sustain life. Take no more nitrogen into the system than will keep the urea down to the physiological level of 3.5 grains per pound of body weight per day in a man of fair activity. If the diet has been a stimulating one, a simpler form must be substituted containing much less nitrogen and more albumin. A diet of bread, breadstuffs, cereals well cooked, eggs sparingly, milk in abundance, a small amount of young meat, chiefly lamb, young mutton, and beefsteak, the white meat of fowl, little fish, fruits raw and cooked, and vegetables growing above the ground, no tea or coffee, is the proper regimen to introduce into the gouty system of a young or middle-aged individual who has a rheumatic or gouty family history with as yet an undeveloped personal history of these diseases, for we all know that certain individuals earlier in life than the quoted age of the development of these diseases—namely, in men the thirtieth to thirty-fifth years, in women the fortieth to forty-fifth years—show in the teeth and skin and also the urine manifestations of what is to come in later years. In the diet of the older individual, with a system degenerated by some systemic disease, a more substantial and more liberal diet must be allowed, in which oil and hydrocarbons may be introduced with benefit. With these persons there is always the doubtful question as to the use of whisky—for sweet and tart wines, burgundy, port, and champagne must be interdicted. To initiate a physiological diet is easier and safer than to feed a system already the subject of degenerative change. The following bit of satire is offered by an enthusiastic anti-rheumatic dietarian: "The man who has rotted and destroyed his teeth by constant contact with the fibrous tissues of fish and flesh, for which they were not intended, is not the least likely to obtain a new set."

Under the head of medicines the aim should be to render alkaline the acid fluids of excretion. Accessory to this aim, effect diuresis to a large degree. But it is one thing to flush the system with large quantities of hot or cold water, and another to change the chemical character of the excreted acid salts—chief of which are the urates of sodium and xanthin. But when diuresis and alkalinity act jointly the products of nitrogenous waste are slowly

and surely eliminated. The salts of vegetable acids are preferable, as the citrates, tartrates, and acetates of potassium and sodium, which in the system are akin to the neutral salts of the alkaline earths such as baryta and lithia. Sodium salicylate is not only a powerful uric acid solvent, but is an anodyne as well, and is very useful as such. In debilitated systems requiring a supporting treatment salts of ferric iodid, with arsenic, hydrocarbons—chief of which is cod-liver oil—quinin, nux vomica, and strychnin, are most useful. Thermal baths, so successfully carried out in many resorts in this country and in Europe, should be advised for those who can afford them. These, in conjunction with friction and massage and enforced exercise, are of the highest avail in chronic states of rheumatic and gouty arthritis, which nearly always involve invasions of both dental and ocular structures.

I cannot emphasize too strongly the watchful supervision a judicious dentist and physician should constantly exercise over patients with these chronic conditions. With their detection in early youth much clinical discomfort and deformity can be saved in later life, while it cannot but redound to our feelings of professional pride and satisfaction.—*Cosmos.*

OUR UNHAPPY PRECEDENTS. By Frank L. Platt, D.D.S. Read before the Southern California Dental Association, October, 1904. All the arts and crafts and sciences which to-day constitute the activities of the world owe their present position, prestige and influence to the combined action of many millions of minds and many millions of experiences. They are the products of the law of evolution and have grown through the ages little by little, each generation taking from its predecessors what it deemed essential or necessary to its progress and handing on to its predecessors the sum of its own accomplishments.

In this evolutionary process precedent has played a most important part, and has in fact been the basis on which all the laws of progress have been founded. The history of every art, science and trade teems with precedent, for even the things called new are sooner or later traced back to a precedent which in a measure foretold their birth. Admitting that precedent plays so important a part in all our activities, it seems strange that any but good precedents should

be preserved, or that present-day occurrences should be a repetition of the foolish or wicked practices of the past. Unfortunately, however, humanity is weak and nature seems more inclined to continue abnormalities than to eliminate them, and so good and bad are alike repeated almost without apparent discrimination. Some philosopher has observed that "Man is largely a creature of habit," and a listening cynic has replied, "Yes, and mostly bad habits," all of which may be true and in a measure may account for some of the peculiar practices of the dental profession, for even our noble calling, at once among the oldest and the youngest of the arts, is held in bondage by the precedents of the pitiless past.

When we hold up for comparison the great triumvirate of healing arts, medicine, surgery and dentistry, it takes no very exhaustive analysis to determine that in proportion to the amount of time, labor and learning expended for a given fee, in money, or reputation, or respect, our profession has decidedly the worst of the comparison. Acting wholly in accordance with precedent, the same individual who will unhesitatingly pay a medical specialist from two to five dollars for five minutes' treatment of a diseased eye, ear or throat, will feel that he is robbed if his dentist charges him ten dollars for treating perhaps a score of times an alveolar abscess, because in the past dentists have not charged for treatments when they have eventually filled or extracted the teeth afflicted with disease.

So, also, will our citizens pay for medical examination and advice because the medical profession has made a practice of charging for these things, but will look pained and offended if a dentist demands a fee for similar services, because it is not customary to charge for them. A surgeon may spend twenty minutes amputating a finger or toe, and his fee of twenty-five, or fifty, or one hundred dollars, with a special charge for the anesthetic, is accepted as a matter of course, *for this is surgery*. A dentist may spend half an hour removing an impacted lower third molar, an operation involving just as much skill and perhaps greater risk to the patient, with proportionately great responsibility on the part of the dentist, and yet only in rare instances of great professional courage will even as much as five dollars be asked for the service, *for this is dentistry*, and in the past many dentists have performed such services apparently mainly for the amusement they derived from them.

A surgeon amputates a limb for from two hundred to one thousand

dollars, and a little later a dealer in artificial limbs supplies a substitute for a few hundreds more. This is surgery, governed by established precedent. A dentist extracts the carious remainders of a set of teeth, and eventually makes an artificial denture to replace them, for from five to twenty dollars, with no charge for extracting. This is dentistry, and in accordance with inane precedent and senseless custom.

The business men, those from whom we buy our coal and provisions, and the heartless but wise corporations which furnish our water and gas, send out and collect their bills each month, and so grow rich or pay dividends on watered stock. This is in accordance with established custom, and looked upon as a matter of course it excites no comment. The average dentist, however, sends his bills out once or twice a year, and very rarely does so until the work is all done for the individual to whom the bill is sent, though the services may have been performed during a period of six months or even more. Almost any exception to this rule excites indignant protest, for it is contrary to precedent, and our patients do not understand the meaning of monthly payments or "cash at the end of each operation."

More unhappy precedents might be enumerated, but these are enough to amply demonstrate the fact that there is need for reform. Dentistry may have originated in the barber shop and its fees may first have been governed by the charge for tonsorial services, but there is now no reason why the fees of the two arts should be so closely related when the arts themselves are so widely separated. The average citizen values what he receives or acquires in accordance with what it has cost him in money or labor, rather than in accordance with its actual worth, and respects the man who can command a good round fee for his services, and if dentistry, which for years has been clamoring for recognition as a branch of the medical profession, or as an individual profession, is ever to attain the position it deserves, or the respect it craves, old precedents must be abandoned and new ones established, and nowhere can a beginning be more fitly made than in making our fees fit our services and our services worthy of our fees. It is useless to attempt to disguise the fact that as a class dentists do not receive the respect that is accredited to other professions, and it is also useless to deny that the profession has failed in its duty to itself and as an educator of humanity. If we

are dissatisfied with what we are and with the position our profession holds we should remember "It is not in our stars but in ourselves that we are underlings."—*Gazette.*

BENEFITS OF ORAL HYGIENE AND PROPHYLAXIS. By L. P. Bethel, D.D.S., M.D., Columbus, O. Read before the Odontological Society of Western Pennsylvania, March, 1904. There seems to be each year an increasing tendency toward prevention rather than cure in various professions. In law many prominent lawyers are now using greater efforts to keep cases out of court than to get them in. In medicine means and ways of prevention occupy the minds of many. In dentistry means of prevention have also been studied with benefit to the public, for comparatively few teeth have to be sacrificed nowadays, on account of improved methods of treatment and restoration. Not satisfied with this, however, a number of our progressive dentists have sought to decrease, if not to prevent, caries of the teeth—the most persistent and destructive of diseases—through hygiene and prophylactic measures, and the results have shown a great step in advance. Dr. D. D. Smith of Philadelphia says that through his monthly prophylactic treatment he has noticed in mouths treated a decrease of from 70 per cent to 90 per cent in carious action. If such results can be obtained, is the subject of prophylaxis not worthy of more attention than has been given it in the past?

It is not my intention to enter into a general discussion of the subject, I hope to show some of the beneficial results from the practice of it, beginnning with a class of people with whom oral hygiene and prophylaxis is made compulsory. As you are all probably aware, the Diamond Match Company has for a number of years employed a dentist to keep vigilant watch over the condition of the mouths and teeth of the employees, especially those engaged in the "dipping room" and other places where phosphorous fumes are generated. While the primary object of this step was to reduce, if possible, the cases of phosphor-necrosis among match-workers, through compulsory care of the mouth and teeth, it has been interesting to watch the general results of the constant application of these hygienic measures as practiced by the employees.

About a year and a half ago Dr. Knowlton, the examiner, invited

me to visit the largest factory, at Barberton, O., and inspect the mouths of the employees. The invitation was gladly accepted, and since that time I have made a trip to Oshkosh, Wis., to investigate the mouths of the employees in the factory at that place, for the purpose of verifying what I had seen in Barberton. The four factories in the United States that belong to this company contain more than two thousand employees—men, women, boys and girls. It is the duty of the dental examiner to make every three months a rigid examination of the condition of the mouth and teeth of every employee. This is done systematically, and tabulated records are kept on file. If any teeth need filling, or if other operations are found necessary, the employee is so notified and is sent to some dentist to have the operations performed. On returning this employee must bring from that dentist to the examiner a certificate stating that the needed operations have been accomplished and that the teeth are again in good condition. These measures are exacted of employees under penalty of discharge.

The condition of the soft tissues of the mouth, especially the gums, is also noted and necessary instructions as to their further care are given to the patient. Especial attention is given to keeping the mouth free from calcareous deposits, and to keeping the gums in a normal condition. Every employee is obliged to brush his teeth and gums at least once a day and to use such mouth-washes and dentifrices as may be prescribed by the examiner. At his next visit the examiner compares the work done with the last instructions as entered in his record-book. If any filling or other operation is found faulty the patient is returned to the dentist who performed it, with instructions to have it made satisfactory.

By this strict supervision over the oral cavity phosphor-necrosis, which used to be common among the match-workers, has been almost entirely stamped out. Aside from limiting this dread disease, the compulsory prophylaxis has been of great benefit to every employee and an educator of no small proportions. These match-workers soon see the benefits themselves and take pride in their beautifully clean teeth and healthy gums, and compulsory care of them becomes a pleasure. The employees comprise the poorer class of working people, who naturally would take little or no care of their teeth. In inspecting the mouths one is impressed with this fact upon seeing the condition of the teeth and mouths of the new employees, cal-

careous and soft deposits with resulting gum inflammation being present. If no attempt be made to keep the teeth and gums clean and stimulated, the irritating influence of the phosphor fumes but adds to the inflammatory trouble. Even in the mouths of employees who for a time give daily care to the teeth and then become negligent—brushing the teeth and gums only once or twice a week, instead of every day—the evil effects of the phosphor fumes are seen. The gums soon become inflamed and congested, and a horrible odor is noticed about the mouth and breath. Where the brush is used diligently once or twice each day, however, and the teeth kept free by the examiner from calcareous and other deposits, the gums present a normal pink tint, are firm to the touch, and have every appearance of perfect health and tone despite the irritating tendency of the phosphor fumes that are constantly inhaled.

Now, if we find dental organs scrupulously clean, gums of a normal tint, firm and healthy, and clean mouths, where these prophylactic means have been employed, even in the face of such unfavorable surroundings and among this class of people, what can be accomplished among patients in a general practice if they can be induced to adopt and conscientiously follow out such prophylactic measures?

The examiner, through observation, says that he is confident that the influence of oral hygiene is farther-reaching than ordinarily imagined. Since its enforcement among these employees it has been a noticeable fact that fewer days are lost through sickness. He believes it has an influence on the digestive tract and that better general health is maintained. It has also been noticed that during epidemics of disease fewer employees are affected by prevailing maladies than before these prophylactic measures were adopted.

After seeing such remarkable results in the mouths of a class of people who naturally give little or no attention to the care of the mouth and teeth, I was curious to see the results of constant care of the teeth of patients in general practice, and through invitation I visited Dr. Smith at Philadelphia. The results of his work were remarkable, especially those in the mouths of patients who had previously been afflicted with severe pyorrheal conditions. Where pyorrheal trouble had been previously treated excessive absorption of gum tissue in many cases was still noticeable, but the gums were tightly attached about the teeth, were of a pink healthy color, and

of firm texture, showing perfect normality with the exception of gum tissue lost through pyorrheal absorption, and even that had been partially restored. Although a number of these cases had been treated years before, the gums, through this monthly treatment and general care, retained their tone, with no signs of a return of the former disease.

This of itself furnishes a valuable lesson for the general practitioner of dentistry. The results of Dr. Smith's prophylactic treatment are all that could be desired and greater than ordinarily would be expected. All the patients had beautifully clean teeth and gums—wholesome, clean mouths—and there was an entire absence of that disagreeable odor noticeable from unkept mouths. These patients invariably stated that their general health was better since they began this systematic treatment and gave their teeth and mouth daily attention at home.

Dr. William Hunter of England, Dr. Miller of Germany, and others have called attention to systemic poisoning from unkept and diseased mouths, and the beneficial systemic results from the adoption of oral hygienic and prophylactic measures, and the cases I have cited, and others where prophylaxis has been employed that have come under my observation, seem to further demonstrate that an unkept mouth is a detriment to the general health of many individuals.

After a patient has selected a dentist and given the care of his teeth to him he takes it for granted that the dentist will give them every attention possible for their preservation, and he has the right to expect the best of care. If the daily care of the mouth and teeth by the patient, and a monthly scaling and cleaning by the dentist, will retard perceptibly the progress of dental caries, improve the general health of the patient, and keep the teeth and gums in their normal condition and make them most presentable, is it not the duty of every dentist to follow such practice? For this prophylactic treatment the dentist is entitled to a fee commensurate with the time consumed, the same as though performing any other dental operation, and I am sure the majority of patients would willingly pay for such service if its importance could be thoroughly impressed upon them. I believe every dentist will be agreeably surprised at the readiness with which intelligent patients will take up with the regular treatment idea when they come to understand the benefits they will derive from it.

This has been not only my own experience, but the experience of all dentists with whom I have conversed who practice the treatment.

I have observed no detrimental effects from this prophylactic treatment, but universally beneficial results, and to my mind every dentist should, so far as possible, practice periodic prophylactic treatment of the teeth and gums of patients, this plan being not only to the interest and welfare of patients but of the dentist as well, and I believe that the results of such procedure and practice will redound more to the dentist's credit than he may ever have imagined.—*Summary.*

ANOMALIES OF THE HARD DENTAL TISSUES. By A. Hopewell-Smith, M.R.C.S., L.R.C.P., L.D.S. Eng. Presented to Section I, Fourth International Dental Congress, at St. Louis, September 1, 1904. In the following communication I have pleasure in submitting a few brief notes on several rare pathological conditions of the enamel and dentin of the teeth of man. They are isolated cases, and so far as it is possible to judge are unlikely very soon to be pluralized. The question of the value of examining and putting on record solitary instances such as those about to be described is one of some importance. Facts are best deduced from a great number of observations, every side of a subject being scrutinized and utilized in all its aspects; incontrovertible proof is most surely obtained from the work of many years and as the outcome of the examination of much material. It sometimes happens, however, that opportunities arise for the investigation of curious irregular conditions which are seldom met with. A study of such is, however, not valueless, but may by its very obscurity and rarity serve two purposes. First, it may be possible at times to find that light is unexpectedly but clearly thrown on normal physiological but not easily understood problems, and second, the sum of our knowledge of the workings of the forces of disease may be enlarged, and consequently the guiding principles of prophylaxis or treatment distinctly benefited. On the other hand, it is possible that partly understood processes—physiological or pathological, as the case may be—may be rendered even more complex and leave the mind in a more chaotic state than before. It is to be hoped, however, that such will not be so in this instance.

The processes of calcification of enamel, dentin and cementum

are defined with some considerable difficulty, and the problems relating to absorption of the hard tissues do not admit of an easy solution. It may be found useful at some distant date to recall the extraordinary appearances presented by the following studies.

Duplication of the Pulp-Cavity.—An upper incisor was removed from the mouth of a young adult for the purpose of relieving the crowding of the anterior teeth. It was apparently sound, save for a longitudinal depression on the mesial aspect of the crown. On preparation and staining it was found to possess two pulp-cavities, each free at the distal extremity but united toward the radicular portion of the neck of the tooth. The smaller cavity was situated on the lingual side. A median vertical section showed that the enamel and dentin of the labial surface were practically normal, but the lingual side displayed several interesting and unique pathological conditions. The enamel was much thickened in amount—there was what one might term hyperplasia of this tissue. It was, moreover, of poor construction, imperfectly calcified in places, but free from caries or external or internal absorption. It colored vicariously and in patches only by the borax-carmine stain. Projecting into this thickened enamel, and close to the primary pulp-cavity, was the subsidiary pulp-chamber, whose surface was smooth and did not present the *foveolæ* of Howship. A thin narrow spur of well-formed dentin, similarly unabsorbed, intervened between it and the free surface of the tooth. Nowhere did the dentin show signs of absorption. It was, generally speaking, fully developed, the tubes ending in the usual manner and extending in the usual direction. The pulp tissue was not well preserved, but fragments exhibited nothing abnormal in its structure.

It is not an easy matter to decide as to the method of the formation of the second pulp-chamber. It is possibly due to segmentation or invagination of the enamel organ on the tongue side of the tooth-germ, and dichotomy of the dentinal papilla in the corresponding situation. Had the process continued to a completer stage there would probably have been found a true gemination of the tooth, by the budding off of a smaller caniniform structure on the inner side. The invagination of the epithelial tissues might be accounted for by the mutual pressure of large teeth-germs in a small dental arch.

Undoubtedly, had it been necessary to drill into the crown, the enamel would have easily snapped off and exposed the pulp in one or both chambers—an element of danger never to be forgotten in the preparation of cavities during the obturation treatment of dental caries.

False Pulp-Nodule.—Suppose this carious process had applied to the root portions of the dentinal germ, a condition such as is exemplified in specimens similar to the next to be described would assuredly be noted. Here the anomaly is in the root; in the case just described it was in the crown. For a section showing this irregularity the writer is indebted to the courtesy of Mr. Leslie Hodges, D.D.S., of Birkenhead, who sent him a section of an upper second premolar. At first sight it appeared that a large pulp-nodule in situ was the only pathological change, but this was not so. Attached to one side of the root-canal, and deflecting the pulp from its usual course and position, was a large oval structure of dentin, having a kernel composed of osseous tissue and soft material containing blood-vessels. It soon became obvious, however, that the center of this adventitious body, which must be considered to be a developmental defect, was a compromise between compact bone and hyperplasic cementum. The lamellæ of properly constituted Haversian systems of the former were absent; the grossly exaggerated lacunæ of the latter were present in a multitude of shapes and sizes. The chief point was the enlarged width of the granular layer of Tomes, with larger spaces than usual. In this respect the periphery of the new structure corresponded very closely with that upon the external part of the cementum, with which it was most probably in direct and continuous communication.

The condition might have been produced by the invagination of a piece of the inner wall of the dental follicle or periodontal membrane, and its inclusion and full development when in situ. Precisely how this was occasioned it is impossible to say. The epithelial sheath of Hertwig—a prolongation downward and then upward of the layer of cells of the internal epithelium of the enamel organ—might, during its formation of the shape of the root, have undergone a spur-like budding, which, projecting inward, produced the appearance noted. At all events this is an example of another obstruction to be met with at times in the

root-canals of teeth, and one which makes the total extirpation of the pulp a remarkably difficult if not impossible operation to perform.

Absorption of Enamel and Dentin.—The last case to be described presents a most rare and extraordinary condition of absorption of the hard tissues. A mandibular third molar whose external configuration was of a more or less normal character was divided several times in a vertical direction to ascertain the structure of an osseous mass situated securely on the exposed surface of the crown. After staining with Weil's process it was found that not only had the greater part of the enamel been removed by some obscure pathological process and compact bone deposited in its place, but that the greater part of the dentin was similarly affected. In one place the amelo-dentinal junction was not only invaded, but the underlying dentin had been removed to such an extent that only a thin layer of hard normal tissue intervened between the pulp and the amelo-dentinal junction. The spaces were thus occupied by a mass of well-formed bone, lacunæ with their bone corpuscles and canaliculi everywhere predominating, and extending as trabeculæ in all directions. The intervening soft tissue presented nothing of a definite structure, as the soft parts had not been retained in their fresh state in physiological relationship to the bone or dentin. It is impossible for enamel or dentin or cementum to become inflamed—their anatomical peculiarities absolutely preclude this—and it is very difficult at first sight to explain the presence of the new adventitious tissue in this situation. Speaking with all reserve, however, it may be that an inflammation of the dental follicle had occurred. Osteoclasts, acting for some long period, had brought about absorption of the enamel surface, more and more of the tissue became removed, and presently the dentin was reached. The pathological work was more rapidly conducted in the latter, because of the ease with which tubular tissue can be absorbed. Simultaneously with the inward march of an army of osteoclasts came multitudes of osteoblasts and soft tissue freely vascularized from the dental follicle, and the result was a repairing of the breach by the production of true bone. That there had been some inflammatory changes in the periodontal membrane and dental follicle was evidenced by the enormous hyperplasia of the

cementum, which in one of the sections extended some considerable distance over the enamel margin. The cementum itself was very lacunated and quite abnormal in character.

It is again obvious that in the operative treatment of such a tooth, a bur in the engine, no matter how lightly used, would suddenly and without warning plunge into the pulp-cavity and expose the surface of that organ.

Recapitulation and Significance.—All these cases—of the frequency of occurrence of which one is unable to form any opinion—point to the fact that should always be borne in mind when excavating carious cavities in enamel or dentin and using the dental engine, namely, that curious developmental and acquired defects of these tissues that in themselves are absolutely outside the realm of diagnosis may exist. Consequently extreme care should ever be exercised in the treatment of cavities, lest any such condition as described should, unwittingly on the part of the operator, but none the less disastrously, be suddenly and inexplicably discovered.—*Cosmos.*

Combination Plates for the Lower Jaw.—I have had patients come to me who have had plate after plate made for the lower jaw, and I have tried other plates for them without success; but when I have cast a metal plate, made rubber attachments to it, and put it in the mouth, I have given absolute satisfaction to the patient and to myself. I can name a number of them just in that condition. While there are some mouths in which if you put a weighted plate it would flop from one side to the other, those are the exceptions to the general rule. Very few patients can stand any pressure on the outer ridge, and if there is any pressure we must go over the other ridge, too. The cheeks help to hold it, I think, and we can get over many difficulties in that way.—J. Bond Littig, *Items of Interest.*

Lip-tie.—Cases of tongue-tie, while uncommon, are of sufficiently frequent occurrence to be well known. F. Griffith (*Annals of Surgery*) states that a shortening of the frenum of the lips is not cited in literature. A case recently occurred in his practice in which the subject—an infant of Italian parentage—presented this abnormality to such a remarkable degree that it necessitated operation. The mid-line of the entire upper lip had been bound to the gum by a fold of tissue continuous with the mucous lining of the mouth, one-eighth of an inch in thickness. The teeth were small but well formed. On opening the mouth the middle of the upper lip rolled directly inward, giving rise to a peculiar expression not apparent when in repose. The direct family history was negative. Treatment consisted in simple section of the frenum.

The Dental Digest.

PUBLISHED THE LAST WEEK OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,

Where All Communications Should be Addressed.

Editorial.

CONFLICT OF DATES IN STATE MEETINGS.

Those of our readers who follow the department of notices in this and other journals must have observed that a great many meetings are held in May. A superficial examination shows that about fifteen state dental societies and five important local or sectional societies hold their meetings during that month. Of course all these states are not adjoining, and it might be that if the meetings were held in different months the attendance at some of them would not be larger, but a great many of the states are near neighbors, and in addition many of the largest meetings of the year are held in May, which makes it almost impossible for exhibitors and for a certain number of progressive dentists, who like to take in the most important dental meetings, to attend any number. It is a fact almost universally admitted that most state dental societies are dismal failures in point of membership and that their meetings are nowhere near so successful, beneficial and well attended as they should be. Undoubtedly one of the principal causes of this distressing condition is the conflicting dates of the meetings. The number of capable essayists and clinicians in dentistry is limited, and a glance at the programs of various societies from year to year will show that a comparatively small number of men forms the "leading features." If the important meetings of the year were not all held in one or two months it would be possible to secure the presence of most of these men at all of them, but as the matter now stands they are so scattered among the various societies as to make it impossible for any of the organizations to offer a really strong and attractive program. Home talent is all right as far as it goes, but those

states which depend upon it alone usually have only a mere handful of men at their meetings. It is admitted that exhibits of dental goods add greatly to the success of dental conventions, and every society nowadays solicits same. However, they make it almost impossible for any but the very largest manufacturers to attend, for with so many meetings occurring at the same time several complete exhibits and attendants must be furnished by each firm. We would suggest that at the coming meetings each society appoint a committee, to confer with similar committees from other organizations and see if a plan cannot be perfected whereby the annual meetings, especially those of the larger states, will not fall on the same dates and so many will not be held in the same month.

As we have said before, one of the main reasons for the unsatisfactory condition of state dental societies is the fact that they and their meetings are not advertised. We have given specific instances of what could be accomplished with a little effort on the part of the officers, but again this year the only notice that most of the meetings get is a four or five line stereotyped form from the secretary, most of them a bald statement of facts and not calculated in any way to increase the attendance or induce non-members to come. The trouble is that the officers and even the societies have fallen into a rut in this respect. The only thing that will save the situation is either the infusion of new blood or a thorough stirring up of the old, and in electing officers this year, especially secretaries and executive committees, the first requisites demanded of the candidates should be energy and a willingness to work. It is a disgrace to dentistry that almost no dental society comprises in its membership more than one-tenth of the dentists of the state. As an example of what can be accomplished by a capable committee, we would call attention to the reorganization of the Illinois State Dental Society. At the meeting last May the organization had a membership of something less than four hundred. At this writing it has about nine hundred, and before the meeting occurs at Moline in May it is expected that over one thousand members will have been enrolled. The committee on reorganization does not intend to stop here, however, and we feel safe in predicting a membership of one

thousand five hundred a year from now. When the Illinois Society embraces half of the dentists in the state, that half being of course the most progressive, it can have effective dental laws passed and will be a power for good in many directions. If other states will do anywhere near as well our national organization will be truly national in scope and influence.

Notices.

ILLINOIS STATE DENTAL SOCIETY.

The annual meeting of the Illinois State Dental Society will be held at Moline, May 9-11, 1905. ELGIN MAWHINNEY, Secy.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association will hold its thirty-fifth annual meeting at Greenfield, May 3-4, 1905. A splendid program of papers and clinics is being prepared. G. E. STEVENSON, Liberty.

CENTRAL MICHIGAN DENTAL SOCIETY.

The Central Michigan Dental Society met at Lansing, March 30, 1905, and elected the following officers: President, R. W. Morse, Lansing; Vice-president, C. W. Horning, Portland; Secretary and Treasurer, O. C. Carr, Lansing.

FOX RIVER VALLEY (ILL.) DENTAL SOCIETY.

The Fox River Valley (Ill.) Dental Society was organized at Elgin, March 9, 1905, and the following officers were elected: President, G. B Elliott, Elgin; Vice-president, C. W. Cox, Batavia; Secretary and Treasurer, C. A. Patterson, Genoa.

LITTLE ROCK (ARK.) DENTAL SOCIETY.

The Little Rock (Ark.) Dental Society was organized March 10, 1905, and the following officers were elected: President, T. M. Milam; 1st Vice-president, L. W. Brown, 2d Vice-president, J. P. Easley; Secretary and Treasurer, Elbert Stewart.

ANDROSCOGGIN VALLEY (ME.) DENTAL SOCIETY.

The Androscoggin (Me.) Dental Society was organized at Lewiston, March 21, 1905, and the following officers were elected: President, E. H. White, Lewiston; Vice-president, Isaac Goddard, Auburn; Secretary, E. W. Bickford, Lewiston; Treasurer, R. B. Record, Auburn.

ALABAMA DENTAL ASSOCIATION.

The next annual meeting of the Alabama Dental Association will be held in Gadsden, May 9-12, 1905. It is earnestly desired and confidently expected that we will have a large attendance and the most successful meeting in the history of the Association. L. A. CRUMLY, Secy., Birmingham.

DISTRICT OF COLUMBIA DENTAL EXAMINERS.

The semi-annual examination of the Board of Dental Examiners of the District of Columbia will be held at Washington July 5-7, 1905. All applications for examination must be accompanied by a fee of $10 and should be filed with SHELDON G. DAVIS, Secy., 607 Thirteenth St., Washington.

UNIVERSITY OF BUFFALO ALUMNI ASSOCIATION.

The sixth annual meeting of the Alumni Association of the Dental Department of the University of Buffalo was held at Buffalo, Feb. 22-24, 1905, and the following officers were elected: President, T. C. Phillips; Vice-president, J. A. Sherwood; Secretary and Treasurer, D. W. Whipple, all of Buffalo.

FARGO DISTRICT (MINN.) DENTAL SOCIETY.

The Fargo District (Minn.) Dental Society was organized at Crookston, March 22, 1905, and the following officers were elected: President, S. J. Hill; Vice-president, H. L. Starling; Secretary, Albert Hallenberg; Treasurer, C. L. Rose; Executive Committee, L. C. Davenport, F. A. Bricker, J. L. Graves.

HENRY-STARK COUNTY (ILL.) DENTAL SOCIETY.

The Henry-Stark County (Ill.) Dental Society was organized at Kewanee, March 1, 1905, and the following officers were elected: President, S. J. Sharp, Kewanee; Vice-president, J. M. Manton, Buda; Secretary, H. M. Wolf, Kewanee; Treasurer, J. C. Warnock, Kewanee; Librarian, R. W. Sharp, Bradford.

NEW JERSEY STATE DENTAL BOARD.

The New Jersey State Board of Registration and Examination in dentistry will hold its semi-annual examination in the theoretical branches in the Assembly Chamber of the State House at Trenton, July 11-13, 1905; practical prosthetic work at the office of Dr. A. Irwin, 425 Cooper st., Camden; practical operative work at the office of Charles A. Stockton, 22 Central ave., Newark. All applications must be in the hands of the secretary ten days prior to the examination. Fee for examination, $25. For information apply to the secretary,

CHARLES A. MEEKER,
29 Fulton st., Newark.

SOUTHERN INDIANA DENTAL ASSOCIATION.

The Southern Indiana Dental Association was organized at Paoli, March 10, 1905, and the following officers were elected: President, E. S. Denbo, Orleans; Vice-president, C. D. Driscoll, Paoli; Secretary, J. D. Vanosdol, Mitchell; Assistant Secretary, F. E. Woods, French Lick Springs; Treasurer, C. B. Tattershall, Paoli.

LAKE COUNTY (ILL.) DENTAL SOCIETY.

The Lake County (Ill.) Dental Society was organized at Waukegan Feb. 9, 1905, and the following officers were elected: President, N. J. Roberts, Waukegan; Vice-president, A. H. Smith, Libertyville; Secretary, O. B. Smith, Waukegan; Treasurer, M. Olive Read, Lake Forest; Librarian, Earl W. Harvey, Grays Lake.

NEW LONDON COUNTY (CONN.) DENTAL ASSOCIATION.

The New London County (Conn.) Dental Association was organized March 7, 1905, and the following officers were elected: President, A. W. Crosby; Vice-president, Edward Prentis; Secretary, Ralph H. Keeler; Treasurer, George N. Bates; Executive Committee, Arthur Prentis, E. P. Fitch, Noank; D. B. Smith, Mystic.

OKLAHOMA DENTAL ASSOCIATION.

The fifteenth annual meeting of the Oklahoma Dental Association will be held in Oklahoma City, commencing at 8 p. m., May 15, and continuing until the evening of the 17th. Indications are for a large and enthusiastic meeting, and the profession is cordially invited to attend.

C. L. WHITE, Secy., Oklahoma City.

MARYLAND STATE BOARD OF DENTAL EXAMINERS.

The Maryland State Board of Dental Examiners will meet for the examination of candidates for certificates May 15-16, 1905, at the Dental Department of the Baltimore Medical College, North Howard St., Baltimore, at 9 a. m. For application blanks and all information address the Secretary.

F. F. DREW, Secy., 701 N. Howard St., Baltimore.

JEFFERSON COUNTY DISTRICT (ILL.) DENTAL SOCIETY.

The Jefferson County (Ill.) District Dental Society, comprising the counties of Marion, Jefferson, Franklin, Hamilton, Saline and Gallatin, was organized at Mt. Vernon, March 15, 1905, and the following officers were elected: President, W. H. Damon, Mt. Vernon; Vice-president, L. W. Brand, Denton; Secretary, J. S. Barter, McLeansboro; Treasurer, C. L. Morey, Centralia; Librarian, R. C. Richardson, Mt. Vernon.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold its first meeting for 1905 in the Capitol building at Des Moines, May 2-3. The second meeting will be held at Iowa City, June 15-16. All those who expect to take the examinations should file their application with the secretary at least two weeks before the examination. E. D. BROWER, Secy., Le Mars.

CENTRAL ILLINOIS DENTAL SOCIETY.

The Central Illinois Dental Society, comprising the counties of Christian, Montgomery, Shelby, Fayette and Bond, was organized at Pana, Feb. 28, 1905, and the following officers were elected: President, J. L. Hoover, Shelbyville; Vice-president, M. Bonbrake, Taylorville; Secretary, J. S. Roberts, Hillsboro; Treasurer, O. H. West, Farina; Librarian, G. N. Gilbert, Pana.

ODONTOLOGICAL SOCIETY OF WESTERN PENNSYLVANIA.

The Odontological Society of Western Pennsylvania held its annual meeting at Pittsburg, March 14, 1905, and elected the following officers: President, W. S. Cook, Beaver Falls; Vice-president, W. L. Haines, Pittsburg; Secretary, B. M. Loar, Mt. Pleasant; Treasurer, J. A. Libbey, Pittsburg; Executive Committee, C. C. Taggart, Pittsburg; M. S. Burns, Sewickley; D. W. Flint, Pittsburg.

SEVENTH DISTRICT DENTAL SOCIETY.

The Seventh District Dental Society held its annual meeting at Rochester, N. Y., March 28-29, 1905, and the following officers were elected: President, C. C. Bachman, Waterloo; Vice-president, C. F. Bunbury, Rochester; Recording Secretary, C. W. LaSalle, Rochester; Corresponding Secretary, G. G. Burns, Rochester; Treasurer, L. Requa, Rochester; Member Board of Censors, F. Messerschmitt, Rochester.

VERMONT STATE DENTAL SOCIETY.

At the twenty-ninth annual meeting of the Vermont State Dental Society, held at Rutland, March 15-17, 1905, the following officers were elected for the ensuing year: President, Dr. Geo. F. Barber, Brattleboro; First Vice-President, Dr. Geo. O. Mitchell, St. Albans; Second Vice-President, Dr. C. H. Kent, Barre; Secretary, Dr. Thomas Mound, Rutland; Corresponding Secretary, Dr. Grace L. Bosworth, Rutland; Treasurer, Dr. W. H. Munsell, Wells River; Executive Committee, Dr. Harry F. Hamilton, Newport; Dr. Charles F. Meacham, Bellows Falls; Dr. A. Z. Cutler, Bennington; State Prosecutor, Dr. J. A. Robinson, Morrisville. The next meeting will be held in Brattleboro, the third Wednesday in May, 1906.

THOMAS MOUND, Secretary.

MONTANA STATE DENTAL SOCIETY.

The Montana State Dental Society held its annual meeting at Butte, Feb. 21, 1905, and elected the following officers: President, T. M. Hampton, Helena; 1st Vice-president, D. J. Waite, Helena; 2d Vice-president, J. C. McDonald, Anaconda; Secretary, T. M. Gailbraith, Butte; Treasurer, D. S. Allen, Billings; Supervisor of Clinics, S. Keyser, Butte. The next meeting will be held at Helena, Feb. 24-25, 1906.

LEBANON VALLEY DENTAL ASSOCIATION.

The thirtieth annual meeting of the Lebanon Valley Dental Association will be held at Pottstown, Pa., May 16-17, 1905. The sessions, clinics and exhibits are to be held in the Auditorium—a commodious and well-lighted hall, with excellent facilities for all purposes. For space, exhibitors should write the chairman of the executive committee,

C. R. SCHOLL, Reading.

CHAMPAIGN-DANVILLE DISTRICT (ILL.) DENTAL SOCIETY.

The Champaign-Danville (Ill.) District Dental Society, a consolidation of the Champaign District Dental Society and the Vermilion County Dental Society, was organized at Champaign, Feb. 28, 1905, and the following officers were elected: President, H. W. Boone, Champaign; Vice-president, G. M. Hanley, Hoopeston; Secretary, H. L. Minnis, Danville; Treasurer, C. P. Howard, Champaign; Librarian, F. M. Conkey, Homer.

OSWEGO (N. Y.) DENTAL SOCIETY.

The Oswego (N. Y.) Dental Society held its annual meeting March 7, 1905, and elected the following officers: President, Thos. R. Cullen; Vice-President, R. C. Turner; Secretary and Treasurer, R. W. Barry; Executive Committee, Sheridan Slocum, J. W. O'Brien, J. S. Watts.

A new list of delinquent patients was prepared, as this feature has proved very satisfactory to the members. Last year there were 150 names on the delinquent list and now there are only 75.

ANY OLD THING IN DENTISTRY.

One of the features of the next annual meeting of the New York State Dental Society, to be held at Albany May 12-13, 1905, will be an exhibit of antique things in dentistry—instruments, pictures, appliances, abnormal models, in short, any old thing in dentistry. If you have any such, bring it with you, or if unable to come, send it with history to Dr. J. L. Appleton, Chairman of Arrangements, 89 Columbia St., Albany, who will see that it is returned to the owner in as good condition as when received.

J. L. APPLETON.

NEW JERSEY STATE DENTAL SOCIETY.

The thirty-fifth annual meeting of the New Jersey State Dental Society will be held in the Auditorium, Asbury Park, N. J., commencing July 19 and continuing until July 22. Headquarters at Hotel Columbia. Rates: one person in room, $3.50; two persons in room, $3.00. Meeting commences promptly at 10 a. m. on the 19th. The various committees have been successful in securing eminent practitioners for papers of present interest, and some fifty clinicians in the most modern up-to-date dentistry. The space in the large Auditorium will be almost filled with all the newest appliances to practice dentistry.

Friday evening will be devoted to the social side with a smoker, including a collation and entertainment to the guests, exhibitors and members. Cut out now the week of July 17 and meet with us.

Seven hundred and fifty-six dentists registered last July—make it a thousand this year. CHARLES A. MEEKER, Secretary, Newark.

NATIONAL DENTAL ASSOCIATION CLINICS.

The National Dental Association will meet at Buffalo, commencing July 25. It is the desire of the president and chairman of the Clinic Section to have the best clinics in the history of the organization. The clinics will be held Wednesday and Thursday, July 26 and 27, in the Buffalo Dental College, where there is every facility for making practical operations, as well as ample room for all those wishing to give table clinics. Forty dental operations will be made each day, and there is room for holding three hundred table clinics. Those interested can apply to

Dr. S. W. Bowles, 1315 New York Avenue, Washington, D. C., Chairman for District of Columbia, Delaware and New Jersey.

Dr. E. C. Blaisdell, 1 Pleasant Street, Portsmouth, N. H., Chairman for Maine, New Hampshire and Vermont.

Dr. F. W. Gethro, 31 Washington Street, Chicago, Chairman for Illinois and Wisconsin.

Dr. L. L. Barber, Spitzer Building, Toledo, Ohio, Chairman for Ohio and Indiana.

Dr. S. Eschelman, 421 Franklin Street, Buffalo, or

Dr. R. Murray, 715 Elmwood Avenue, Buffalo, Chairmen for New York and Ontario, Canada.

Dr. M. F. Finley, 1928 1st Street, Washington, D. C., Chairman for District of Columbia, Virginia and West Virginia.

Dr. T. P. Hinman, 22 S. Broad Street, Atlanta, Ga., Chairman for Georgia, North Carolina, South Carolina, Florida, Alabama, Mississippi, Tennessee, Louisiana and Texas.

Dr. H. B. McFadden, 3505 Hamilton Street, Philadelphia, Chairman for Pennsylvania.

Dr. G. E. Savage, 518 Main Street, Worcester, Mass., Chairman for Massachusetts, Connecticut and Rhode Island.

Dr. S. H. Voyles, 3201 Washington Avenue, St. Louis, Chairman for Missouri, Arkansas, Kansas and Nebraska.

Those having new instruments, appliances, etc., are cordially invited to display them. Communicate with your State Chairman or with

E. K. WEDELSTAEDT, Sec'y Clinic Section.

204 New York Life Bldg., St. Paul.

LEWIS AND CLARK DENTAL CONGRESS.

The Lewis and Clark Dental Congress will be held at Portland, Ore., July 17-20, 1905. The movement of the Congress has developed so rapidly and over such a greatly increased territory that it has become necessary to appoint committees in nearly every state in the union. A list of these committees will be found in this issue of the DIGEST. The societies of Oregon, Washington, California, Idaho and British Columbia have formally adjourned their meetings for this year in order that their entire membership may attend the Congress. From these five societies alone we can safely count upon an attendance of 1,000 dentists, and there is the possibility that the states of Utah and Colorado will take the same action. The meeting will close in time to allow for the trip east to attend the National Dental Association meeting in Buffalo. The low railroad rates of $56 round trip from Chicago, and $45 round trip from Missouri River points, with a 90-day limit on tickets which will be good coming to the coast by one route and returning by another, will make the trip one of pleasure and interest to our eastern friends. The climate of Portland in July is ideal, and all may be assured of escaping the heat of an eastern or southern summer. Accommodations for visitors may be secured and rooms reserved in advance by addressing the Hotel Portland, the Imperial Hotel, the Hotel Perkins, or in private houses from the Lewis and Clark Accommodation Bureau which, under the supervision of the Fair officials, has secured a large number of desirable rooms at reasonable rates. The Stomotalogical Club will provide club rooms for the visiting dentists, where they can make their headquarters, secure their mail, etc. Our program is rapidly assuming a size and interest equal to that given at St. Louis last year, and we are assured of an exhibit of dental goods quite as fine. We want every one to come and enjoy a fine dental meeting and the hospitality of the west, the Pacific Coast, and especially of this city.

ARTHUR W. CHANCE, Portland.

AMERICAN MEDICAL ASSOCIATION—SECTION ON STOMATOLOGY.

The next meeting of the American Medical Association will be held in Portland, Oregon, July 11-14, 1905. The program for the Section on Stomatology is as follows:

1. Chairman's Address, Vida A. Latham, Chicago.

2. The Causes and the Treatment of the Mouth Manifestations of Certain Metabolic Disorders, Alfred C. Croftan, Chicago.

3. The Oral Manifestations of Diabetes Mellitus, Hermann Prinz, St. Louis.

4. The Urine and Saliva in So-called Pyorrhea Alveolaris, Wm. J. Lederer, New York.

5. Further Researches in the Treatment of Interstitial Gingivitis, Eugene S. Talbot, Chicago.

6. Excretion of Toxic Products into the Mouth with Relation to Local Infection, Fenton B. Turck, Chicago.

7. The Relations of Dentistry to General Medicine, Samuel A. Hopkins, Boston.

8. A Common Ground for Medicine and Dentistry, Frank L. Platt, San Francisco.

9. The Physician as a Dentist, Calvin W. Knowles, San Francisco.

10. The Physician's Duty to the Child from a Dental Standpoint, Alice M. Steeves, Boston.

11. Dentistry of To-morrow, H. P. Carlton, San Francisco.

12. What Will Probably be the Dental Educational Standard for the Coming Decade? C. C. Chittenden, Madison, Wis.

13. Fatal Oral Pathologic Conditions, G. V. I. Brown, Milwaukee.

14. Surgical Bacteriology of the Mouth, A. H. Levings, Milwaukee.

15. Surgical Aspects of Disturbed Dentition of the Third Molar, M. L. Rhein, New York.

16. The Treatment of Suppurative Affections of the Face and Neck Emanating from the Mouth, M. I. Schamberg, Philadelphia.

17. The Medical Relations of Certain Conditions of the Mouth, L. Duncan Bulkley, New York.

18. Some Effects of Inebriety on the Teeth and Jaws, T. D. Crothers, Hartford, Conn.

19. The Ossification of the Lower Jaw, Edward Fawcett, Bristol, Eng.

20. Ankylostomiasis and Tongue Pigment, T. M. Russell Leonard, Grenada, British West India.

21. Notes on Tooth Genesis in Man, H. W. Marett Tims, London, Eng.

22. The Etiology of Tooth Corrugations, G. Lenox Curtis, New York.

23. To What Extent Are Teeth Necessary to the Human Being? M. H. Fletcher, Cincinnati.

24. Anesthesia by Ethyl-Chlorid and Similar Agents, H. C. Miller, Portland, Oregon.

25. The Röntgen Rays in Dentistry, M. Kassabian, Philadelphia.

The program is entirely scientific. All dentists are invited to be present and take part in the discussions. Those wishing to become members may do so by filling out blanks furnished by the Association, signed by the president and secretary of state or local dental or medical society, enclose five dollars and send to the Secretary of the Section on Stomatology for his signature. This also includes the Journal of the American Medical Association for one year.

EUGENE S. TALBOT, Secretary, Chicago.

LEWIS AND CLARK DENTAL CONGRESS.

The Executive Committee of the Lewis and Clark Dental Congress, to be held at Portland, Ore., July 17-20, 1905, has appointed the following committees:

Alabama.

Hon. Chairman, Jas. A. Hall, Collinsville.
Com. on Essays, H. C. Hassell, Tuscaloosa.
Com. on Clinics, T. P. Whitby, Selma.
Com. Membership, Geo. S. Vann, Gadsden.

Arkansas.

Essays & Clinics, Wm. H. Buckley, Little Rock.
Com. Membership, Chas. Richardson, Fayetteville.

Connecticut.

Hon. Chairman, Jas. McManus, 180 Pratt St., Hartford.
Com. on Essays, E. S. Gaylord, 1110 Chapel St., New Haven.
Com. on Clinics, Chas. McManus, 180 Pratt St., Hartford.
Com. Membership, J. Tenney Barker, Wallingford.

Delaware.

Essays & Clinics, W. L. Grier, Milford.
Com. Membership, C. R. Jeffries, 1016 Delaware Ave., Wilmington.

District of Columbia.

Essays & Clinics, J. H. London, 1115 G St., N. W., Washington.
Com. Membership, M. F. Finley, 1928 I St., N. W., Washington.

Florida.

Essays & Clinics, J. E. Chace, Ocala.
Com. Membership, W. G. Mason, Tampa.

Georgia.

Com. on Essays, H. H. Johnson, Macon.
Clinics & Memb., T. P. Hinman, 22½ S. Broad St., Atlanta.

Illinois.

Hon. Chairman, G. V. Black, Lake & Dearborn Sts., Chicago.
Hon. Chairman, E. S. Talbot, 100 State St., Chicago.
Com. on Essays, J. G. Reid, 67 Wabash Ave., Chicago.
Com. on Clinics, D. M. Gallie, 100 State St., Chicago.
Com. Membership, A. H. Peck, 92 State St., Chicago.

Indian Territory.

Com. on Clinics, C. W. Day, Vinita.
Com. Membership, S. E. Lang, S. McAlester.

Indiana.

Hon. Chairman, G. E. Hunt, 131 E. Ohio St., Indianapolis.
Essays & Clinics, J. I. Byram, 131 E. Ohio St., Indianapolis.
Com. Membership, M. A. Mason, 130 W. Wayne St., Fort Wayne.

Iowa.

Com. on Clinics, W. R. Clack, Clear Lake.
Com. Membership, Wm. Finn, Cedar Rapids.

Kansas.

Hon. Chairman, A. H. Thompson, Topeka.
Com. on Essays, Frank O. Hetrick, Ottawa.
Com. on Clinics, Geo. A. Esterly, Lawrence.
Com. Membership, C. B. Reed, Topeka.

Kentucky.

Hon. Chairman, W. E. Grant, Masonic Bldg., Louisville.
Essays & Clinics, Max M. Eble, Equitable Bldg., Louisville.
Com. Membership, J. R. Wallace, 750 Third St., Louisville.

Louisiana.

Essays & Clinics, C. Victor Vinges, 830 Canal St., New Orleans.
Com. Membership, Jules J. Sarrazin, 531 Canal St., New Orleans

Maine.

Com. Membership, H. A. Kelly, 609 Congress St., Portland.

Maryland.

Hon. Chairman, B. Holly Smith, 1007 Madison St., Baltimore.
Com. on Clinics, W. G. Foster, 9 N. Franklin St., Baltimore.
Com. Membership, C. J. Grieves, Park & Madison, Baltimore.

Massachusetts.

Hon. Chairman, W. E. Boardman, 184 Boylston St., Boston.
Com. on Clinics, C. W. Rodgers, 165 Harvard St., Boston.
Com. Membership, J. F. Dowsley, 175 Tremont St., Boston.

Michigan.

Hon. Chairman, Geo. L. Field, Fife Bldg., Detroit.
Clinics & Memb., Henry C. Raymond, Majestic Bldg., Detroit.

Minnesota.

Hon. Chairman, E. K. Wedelstaedt, N. Y. Life Bldg., St. Paul.
Com. on Clinics, A. C. Searl, Owatonna.
Com. Membership, Jas. E. Weirick, 138 E. 6th St., St. Paul.

Mississippi.

Com. on Essays, W. E. Walker, Bay St. Louis.
Com. on Clinics, W. O. Talbot, Biloxi.
Com. Membership, T. B. Wright, Coffeeville.

Missouri.

Hon. Chairman, Burton Lee Thorpe, 3666 Olive St., St. Louis.
Com. on Essays, J. P. Root, Deardorff Bldg., Kansas City.
Com. on Clinics, D. O. M. LeCron, New Trust Bldg., St. Louis.
Com. Membership, E. E. Haverstick, Boyle & Maryland, St. Louis.

New Jersey.

Hon. Chairman, Chas. A. Meeker, 29 Fulton St., Newark.
Com. on Clinics, Chas. S. Stockton, 7 Central Ave., Newark.
Com. Membership, R. M. Sanger, East Orange.

New York.

Hon. Chairman, H. J. Burkhart, Batavia.
Hon. Chairman, Wm. Carr, 35 W. 46th St., New York City.
Com. on Essays, R. H. Hofheinz, Chamber of Commerce, Rochester.
Com. on Clinics, Ellison Hillyer, 472 Green Ave., Brooklyn.
Com. Membership, Jno. I. Hart, 118 W. 55th St., New York.

North Carolina.

Hon. Chairman, V. E. Turner, Raleigh.
Com. on Essays, E. J. Tucker, Roxboro.
Com. on Clinics, Chas. L. Alexander, Charlotte.
Com. Membership, J. A. Gorman, Asheville.

Ohio.

Hon. Chairman, L. P. Bethel, 1255 Neil Ave., Columbus.
Com. on Essays, L. L. Barber, The Spitzer, Toledo.
Com. on Clinics, Henry Barnes, New England Bldg., Cleveland.
Com. Membership, H. C. Brown, 185 E. State St., Columbus.

Pennsylvania.

Hon. Chairman, J. A. Libbey, 500 Penn. Ave., Pittsburg.
Hon. Chairman, Wilbur F. Litch, 1500 Locust St., Philadelphia.
Hon. Chairman, S. H. Guilford, 1728 Chestnut St., Philadelphia.
Com. on Essays, E. C. Kirk, P. O. Box 1615, Philadelphia.
Com. on Clinics, H. B. McFadden, 3505 Hamilton Ave., Philadelphia.
Com. Membership, J. T. Lippincott, 1483 Walnut St., Philadelphia.

South Carolina.

Clinics & Mem., L. P. Dotterer, 102 Broad St., Charleston.

Tennessee.

Hon. Chairman, J. Y. Crawford, Jackson Bldg., Nashville.
Com. on Essays, A. R. Melendy, Deaderick Bldg., Knoxville.
Com. on Clinics, J. P. Gray, 212 N. Spruce St., Nashville.
Com. Membership, R. Boyd Bogle, 623½ Church St., Nashville.

Texas.

Hon. Chairman, J. W. David, Corsicana.
Com. on Essays, J. G. Fife, Dallas.
Clinics & Memb., M. S. Merchant, Giddings.

Virginia.

Com. on Essays, L. M. Cowardin, 407 E. Main St., Richmond.
Com. on Clinics, F. W. Stiff, 600 E. Grace St., Richmond.
Com. Membership, H. W. Campbell, Suffolk.

Wisconsin.

Hon. Chairman, C. C. Chittenden, 21 W. Main St., Madison.
Essays & Clinics, G. V. I. Brown, 445 Milwaukee St., Milwaukee.
Com. Membership, E. A. Gatterdam, 3rd & Main St., La Crosse.

Hawaii.

Hon. Chairman, J. M. Whitney, Honolulu.
Clinics & Memb., M. E. Grossman, Honolulu.

Canada.

Com. on Essays, A. E. Webster, 3 College St., Toronto.
Clinics & Memb., Edward Abbott, 13 College St., Toronto.

Mexico.

Clinics & Memb., Jose J. Rojo, No. 2 Plateros, City of Mexico.

News Summary.

E. GROSSMAN, 27 years old, a dentist at Cleveland, O., died March 2, 1905.

E. A. KIMPTON, 40 years old, a dentist at Brooklyn, died March 11, 1905.

F. R. PALMES, a dentist at Le Sueur Center, Minn., died March 17, 1905.

R. STORK, 45 years old, a dentist at Elizabeth, N. J., died March 18, 1905.

W. A. HINES, 82 years old, a dentist at Manchester, Ia., died March 31, 1905.

W. M. ROGERS, 80 years old, a dentist at Shelbyville, Ky., died March 25, 1905.

V. C. MILLER, 37 years old, a dentist at Toledo, O., has been adjudged insane.

J. W. SLONAKER, a dentist of Chicago, died of diabetes March 22, 1905, at Denver.

J. N. ALGEO, 48 years old, a dentist of Newark, O., died March 8, 1905, of tuberculosis.

CHAS. ACKERT, a dentist at Marshalltown, Ia., died March 24, 1905, of typhoid fever.

J. C. REYNOLDS, a dentist of Colorado Springs, died March 23, 1905, after a long illness.

J. E. ROURKE, a dentist of South Boston, Mass., died March 7, 1905, after a short illness.

W. E. DOHENY, 30 years old, a dentist at Pawtucket, R. I., died March 14, 1905, of pneumonia.

H. C. MCFALL, a dentist at Mayfield, Ky., fell from a window March 28, 1905, and was killed.

A. L. GREEN, 30 years old, a dentist at LeRoy, N. Y., died March 23, 1905, after a short illness.

J. R. MAGUIRE, a dentist of Lewistown, Ill., died April 1, 1905, after a long illness from diabetes.

S. E. SCHIRMER, 40 years old, a dentist at Los Angeles, Cal., committed suicide March 3, 1905.

E. H. SCHULTZE, a dentist at Salt Lake City, Utah, committed suicide by drowning, March 4, 1905.

A. F. HOLLIDAY, 38 years old, a dentist at Payson, Utah, died suddenly of pneumonia, March 23, 1905.

J. E. BARRICKLOW, 48 years old, a dentist at Columbus, O., died suddenly April 2, 1905, from heart failure.

C. W. BLEND, 39 years old, formerly in practice at Chicago and lately at Pittsburg, died March 25, 1905.

JOHN HOLDEN, a dentist of Washington, D. C., accidentally shot himself March 2, 1905, and died March 16.

W. G. DETWEILER, one of the oldest practicing dentists in Easton, Pa., died suddenly of heart failure March 23, 1905.

C. L. GODDARD, 55 years old, a prominent dentist of San Francisco, died suddenly of heart failure, March 30, 1905.

WILLIAM KIESAU, 34 years old, a dentist at Norfolk, Neb., died March 5, 1905, after a long illness from brain trouble.

W. W. ALTON, 34 years old, a dentist at Hamilton, Can., died March 22, 1905, of heart failure, following typhoid fever.

JOHN FORSCH, 30 years old, a dentist at Londonville, O., died March 15, 1905, after a few hours illness from pneumonia.

W. S. DEPEW, 39 years old, formerly in practice at Middleport and Jamestown, N. Y., died at Tampa, Fla., March 5, 1905.

EDWARD DUNNING, 24 years old, a dentist at Franklin, N. Y., died suddenly March 17, 1905, from cerebro-spinal meningitis.

EUGENE SMITH, 30 years of age, formerly in the practice of dentistry at Philadelphia, died at Sidney, N. Y., March 17, 1905, after a long illness.

DIVORCE. Carrie S. Fields was last month granted a divorce from her husband, L. S. Fields, a dentist of Sanborn, Ia.

E. J. WEEKS, a dentist at New Bedford, Mass., was sent to a sanitarium, March 4, suffering from a mental attack which it is hoped will prove only temporary.

NOTE TO AN M. D.—Please, Doctor, Lizzie's got the mumps, and mother wants to know how much you'll give her to spread it all over town.—*Alk. Clinic.*

PLAUSIBLE.—Thoughtful Boy (contemplating newly-arrived sister): "But, Mamma, she must have wasn't before she was, didn't she?"—*Ex.*

M. W. MILES, 55 years old, formerly in the practice of dentistry at Chicopee Falls and lately at Enield, Mass., died suddenly March 13, 1905, of cerebral hemorrhage.

NEURALGIA OR MUSCULAR PAIN.—Guaiacol mixed with an equal part of glycerin and applied over the seat of neuralgia or muscular pain will often give quick relief.—*Medical Summary.*

SENSITIVE NECKS OF TEETH.—Make an application of a saturated solution of carbonate of potassium in glycerin. Does not discolor like nitrate of silver; very efficient and decidedly less infective than chlorid of zinc.—*Gazette.*

CAVITIES IN THE TEMPORARY TEETH.—Oxyphosphate of copper cement is a non-conductor and a strong antiseptic, and I consider it one of the best filling materials we have for temporary teeth.—G. A. MAXFIELD, *Cosmos.*

GOLD VERSUS AMALGAM.—We all admit that from an artistic standpoint it is more satisfactory to use gold, but artistic results should be a secondary consideration. Comfort and utility should be first considered.—J. P. ROOT, *Western.*

MATRIX FOR INLAY WORK.—The less the matrix is burnished in the deep parts of the cavity and the more it is thinned out at or near the margins the more nearly will the margins of filling and cavity meet.—C. N. THOMPSON.

HYPODERMIC NEEDLE STERILIZATION.—Place pure alcohol in hypodermic needle, then pass the needle through an alcohol flame. The alcohol in needle will burn, causing the needle to become aseptic and dry.—A. W. GRUEBBEL, *Brief.*

DRYING OUT ROOT CANALS.—The advantage a chip blower heated over an alcohol lamp has over an electric hot air syringe is this: The air taken in by the chip blower from an alcohol flame is converted into formaldehyde gas and is the best disinfectant on earth.—HOMER ALMON, *Review.*

FEARS DENTIST AND RUNS AWAY.—Last month the mother of a fourteen-year-old boy in Chicago sent him to a dentist to have a tooth extracted, but he did not arrive there, and it is thought that fear of the operation caused him to run away.

PEROXID AND LIME WATER.—The dilution of peroxid with an equal volume of lime-water corrects any acid condition that may exist, retards the destructive influence of H_2O_2 on granulations, and does not detract from its efficiency.—*Forum.*

IDENTIFIED BY THE TEETH.—One of the employes of the shoe factory in Brockton, Mass., which was recently wrecked by an explosion, has been identified by means of his false teeth, the body being so badly mutilated that identification by other means was impossible.

HORSES WRECK DENTIST'S OFFICE.—Last month a team of horses at Hornellsville, N. Y., ran away and crashed through the window of a dental office which was unfortunately located on the ground floor. The interior was completely wrecked, but luckily no one was in the office at the time.

FAULTY DENTURES.—To clearly locate on the plate the irritated spot, place a little moistened whiting on the curve of a spatula and apply it to the spot in the mouth. Put the plate in place, and on removing it the place demanding relief is clearly indicated.—L. P. HASKELL, *Review.*

TO SOFTEN MOLDINE.—Take a freshly mixed piece of plaster of Paris and place the moldine upon it, leaving it over night. The moldine will absorb sufficient moisture from the plaster. To get rid of extra moisture in moldine, lay it upon a dry pine or poplar board.—HOMER ALMON, *Review.*

WATER DRINKING.—Just as a good rainstorm cleans out the gutters, so an abundance of water will do great good to a patient threatened with kidney disease. Without this the kidneys are trying to secrete practically mud, urine so thick that the kidneys are clogged.—DR. DAWBARN, *Items of Interest.*

MOUTH STERILIZATION.—While it is undoubtedly true that it is practically impossible to sterilize the mouth, it is also true that the mouth bacteria may be so thoroughly subjugated in a few minutes as to result in great practical benefit to the patient undergoing operations.—H. W. GILLETT, *International.*

GAS CAUSES KLEPTOMANIA.—A shoplifter in Toronto gave as her reason for not being responsible for her acts on that particular day that she had taken gas for some dental operation. The responsibilities for administering gas seem to be getting greater as time goes on. The court did not seem to see the point.—*Dominion.*

CONVENIENT USE FOR THE RUBBER DAM.—A strip of dam about two inches wide and four inches long—or as long as necessary for the case—placed over a heavy moustache and tightened up with the holder will give great comfort to the operator while working on the posterior lower teeth.—OLIVER MARTIN, *Review.*

THE SOCIAL SIDE.—To those worthies who would crowd themselves in where they are not wanted, and who are craven to that degree that they would always "If it please you, Sir," we recommend the following from an old libretto by Gilbert:

"With a view to rise in the social scale,
He shaved his bristles, and he docked his tail,
He grew moustachios, and he took his tub—
And he paid a guinea to a toilet club.

"He bought white ties, and he bought dress suits,
He crammed his feet into bright tight boots—
And to start in life on a brand new plan,
He christened himself [a dental] Man."—*D. O. & Lab.*

BANKRUPTS.—S. W. Dennis, a dentist of San Francisco, has been declared bankrupt, and on March 21 the court ordered his office furniture and other possessions to be sold to satisfy a judgment.—D. F. Meyers, a dentist of Springfield, Mass., filed a petition in bankruptcy March 30, giving his liabilities as $544 and his assets as $75.

SECONDARY HEMORRHAGE DURING THE PERIOD OF REACTION FROM SHOCK.—It is during the period of reaction from shock that secondary hemorrhage is to be feared. In order to prevent it, tie all vessels that have been severed, even if they are not bleeding, use reasonable pressure through your dressing and inspect often.—*Intern. Jour. of Surg.*

TO REMOVE INLAY MATRIX WITHOUT BENDING.—A good way to remove a matrix from a tooth cavity is to tie a knot in the end of a thread and lay it in the bottom of the matrix, then cover it with warm wax, which may be pressed perfectly to the cavity walls. When chilled the matrix may be handled with ease.—F. W. HARNDEN, *Gazette.*

OXYPHOSPHATE OF COPPER CEMENT.—We frequently find children's teeth so sensitive that it is almost impossible to clean out the decay at all. You can manage these cases with this cement. It is not necessary for the cavity to be perfectly dry, for the cement will adhere to the walls of the cavity and become very hard.—G. A. MAXFIELD, *Cosmos.*

TOWN-BRED VERSUS COUNTRY-BRED CHILDREN.—It is a well-known fact that children brought up in towns have generally a worse physique and much worse teeth than country-bred children. This no doubt arises from the fact that the town-bred child's diet consists largely of, or is supplemented by, the products of the pastry-cook and the confectioner.—J. SIM WALLACE, *Record.*

STERILIZATION OF WATER.—According to Paterno and Gingolani, water may be completely sterilized by the addition of silver fluorid 1 part to 500,000. A slight turbidity takes place on the addition of the fluorid, but after twenty-four hours the water is very bright, and the amount of silver remaining in solution is so slight as to be of no importance.—*Chemist and Druggist.*

TEMPORARY FILLING.—Absorbent cotton saturated with cement which has been mixed to a creamy consistency makes an excellent temporary filling material. It will last for months. If only required for a short time, nearly fill the cavity with dry cotton before inserting the plug. This will facilitate the removal of the filling when it becomes necessary.—R. E. SPARKS, *Review.*

EXAMINING BOARD AFFAIRS.—March 16, the governor appointed the following members of the Idaho State Board: S. A. Milkey, Hailey; C. L. Burns, Boise.—March 9, the governor appointed George S. Todd of Lake City as a member of the Minnesota Board, to succeed C. H. Robinson.—At the February meeting of the Wisconsin Board 6 out of 11 applicants were successful in passing the examination.

RECURRENT SEPSIS IN ROOT-CANALS.—Cotton is a perfect barrier to prevent the ingress and egress of microorganisms; iodin is a germicide,

antiseptic and antipyretic; tannic acid will render connective tissue inert. Hence after sterilizing the canal, seal the apex with cotton dipped first in tincture of iodin and then in finely-powdered tannic acid. If discoloration ensues it is always due to faulty manipulation.—D. SHEEHAN, *Summary.*

FIRES.—March 15, a fire in an office building at Berkeley, Cal., damaged the offices of several dentists.—J. W. Dixon, Centralia, Ill., March 21, loss $200, fully insured.—W. T. Hendricks, St. Clair, Mich., Feb. 26, loss $400.—J. C. Eberhardt, Mankato, Minn., March 13, loss $450.—L A. West, St Louis, March 1, loss $400.—D. W. Williamson, New York, March 6, loss $1,000, fully insured.—T. T. Brand, Urbana, O., March 7, loss $200, fully insured.

"FIXATION WORK."—If it is desired to fix a post or set-pin in a funnel-shaped cavity or any kind of fixation work in a confined space, and when great strength is required, fix the pin or whatever it is with cement, and while the cement is still soft force into it some amalgam and finish it off with an entire surface of amalgam. This will give the most perfect result attainable as regards permanence and strength.—HARRY BALDWIN, *Brit. Dent. Jour.*

METHOD OF CLEANING AND POLISHING GERMAN SILVER.—German silver is very often used in dentistry, but is rather hard to swage and polish. While working this metal I anneal it by heating to a red heat and plunging in a solution of oxalic acid. This cleans and softens the metal better than any method I know of. When the appliance is ready to polish I employ Burnishine or Solarine instead of pumice or whiting. I accidently discovered this method and find it effective.—C. J. HADLEY, *in Review.*

STOVAIN.—De Lapersonne states that this anesthetic is an amylene chlorhydrate, two and one-half times less toxic than cocain, disagreeable upon first application to the cornea, but valuable in eye operations, except in iridectomy and when repeated anesthesia is required for tenontectomy. In subcutaneous and subconjunctival injections it seems to be superior to cocain. The writer recommends the use of one drug after the other.—*N. Y. Med. Jour.*

DRY TREATMENT OF BURNS.—Sattler (*Wien. med. Presse*) reports one hundred cases of burns treated with xeroform, which is freely dusted over the inflamed surface and then covered with powder and dressings. These are left undisturbed for six days, and then redressed in a bath. The treatment commends itself because (1) it alleviates pain and distress rapidly; (2) the wounds clean rapidly; (3) the raw surfaces are quickly covered with healthy granulations and the epidermis rapidly closes in.

FILLING AN IMPRESSION FOR A CROWN.—In making a model for an anterior crown difficulty is sometimes experienced in flowing the soft plaster around the pin and cap in the impression, without forcing it from the correct position. By holding a small amount of freshly-prepared soft plaster on the spatula near the pin it can be conveniently forced to position over the cap and around the pin with the aid of a chip blower, without danger of dislodging it from the correct relation, as no jarring of the impression will be necessary. The impression can then be filled in the

usual way. This method will be found advantageous in investing delicate matrices for inlay work, or any work requiring care in making the investment.—*Review.*

FATALITIES.—This month a man at Magnet, Neb., aged 35, died a few hours after having three teeth extracted. A local anesthetic was used. March 19, a woman in New York, aged 30, died suddenly in a dentist's chair after the extraction of one tooth. Gas was used.—March 8, a woman at Cleveland, 26 years old, died of heart failure in a dentist's office before he had a chance to extract the teeth which she wished taken out. A physician had administered chloroform.—March 16, a boy, 12 years old, died at Frazeysburg, O., from blood poisoning following the unskillful extraction of a tooth.

ACCIDENTS.—March 23, a vulcanizer exploded in the laboratory of Reese & Wiedhoff, dentists in Chicago, and was blown through the skylight of the building, falling to the sidewalk, but fortunately no one was injured.—Last month Dr. L. H. Kraft of Collinsville, Mo., extracted a badly lecayed tooth for one of his patients. As it came out the pressure of the forceps crushed the hollow crown and the splinters flew in all directions. Three or four of the fragments struck the doctor's left eyeball, and the next day the eye had swollen and had been poisoned to such an extent that only prompt treatment by a specialist saved it.

TRICHLORACETIC ACID.—I wish to speak a good word for trichloracetic acid in dental practice, because I believe it has a wider range of application than any other single preparation. First, it is most excellent in the treatment of pyorrhea, arresting the accumulation of pus in very short order. In the treatment of putrescent pulp-canals it acts like a charm; carefully applied to spongy gums it gives better results than anything else; in pericementitis arising from calcic deposits it is excellent. It is both escharotic and astringent and it destroys abnormal surface tissue and purifies the same in a few moments after being applied.—H. C. McK., *Brief.*

ASEPSIS IN TOOTH-EXTRACTION.—The extraction of a tooth is a surgical procedure, and as such should be conducted under strict asepsis, or as nearly so as can be obtained in the mouth by the use of harmless germicides. It is just as important that the mouth be thoroughly rinsed with an antiseptic wash immediately before extraction as it is after it. Unfortunately, most patients are only impressed with the need for rinsing the mouth to get rid of the blood which accumulates there after a tooth is drawn. They should be made to know the value of oral antisepsis prior and subsequent to any surgical work about the mouth.—M. I. SCHAMBERG, *Brief.*

INFLUENCE OF DENTAL AFFECTIONS ON THE ETIOLOGY OF EYE TROUBLES.—By WILLIS O. NANCE, in *Arch. de Stom.* Nance reports a case of an abscess in the orbit of the eye caused by an unsound tooth, the extraction of which fortunately arrested what might have been a fatal result. Another case of "Migraine" with partial paralysis (paresis) of the lens of the eye of a patient suffering from hypermetropic astigmatism was cured by treat-

ing an unsound upper molar. Two cases of episclerotitis, accompanied by dental neuralgia and disappearing with the latter, were cured only by treatment or extraction of the tooth. It is consequently of importance to include dental lesions in the possible etiology of diseases of the eye.

MARRIAGES.—Edwin O. Clapp, a dentist of Springfield, Mass., was married to Miss Rose E. Alexander of Springfield, March 28.—V. M. Gregg, a dentist of Eaton, O., was married to Miss Nettie Appleby of Eaton, March 16.—J. A. Lima, a dentist of Fall River, Mass., was married to Miss Sarah C. McNulty of Fall River, March 2.—M. G. McAlister, a dentist at Nelson, Mo., was married to Miss Birdie Townsend of Nelson, March 8.—E. C. Parr, a dentist at Ft. Jones, Cal., was married to Miss Eva Anderson of Henley, Cal., March 6.—T. J. Ireland, a dentist of Peoria, was married to Miss Elsie Schulze of Pottsdam, Germany, March 27.—P. W. Yeardsley, a dentist of Ritzville, Wash., was married to Miss Bertha A. Nye of Spokane, March 20.

THE TOOTH PASTE.—He was a dentist, and, as a natural sequence, a connoisseur in tooth powder. Once, when staying for the night at a village inn, he found that he had forgotten to bring his tooth powder. Looking around the bedroom, he found a box containing powder, which he used and found excellent. Next morning he apologized to the landlady for using her tooth powder.

"Tooth powder!" she said; "we have none."

"Oh, yes," said the dentist, "I assure you I know tooth powder. I used it and found it capital. It was in a small box on the mantelpiece, and—

"That!" shrieked the landlady, "that was no tooth powder. That was aunty!"

"Aunty" had been cremated.

CARIES AMONG THE COOLIES OF NATAL.—The sugar plantations in Natal are worked by coolie labor, the coolies being imported from India for the purpose. Each plantation has its coolie quarter—a little world in itself. It has also its own private hospital, and a medical man from the nearest village attends daily. The principal ailment these people suffer from is toothache. The young cane is very luscious; it is also very nourishing. The food the coolie lives on is not rich in health-sustaining ingredients; it consists principally of rice, oil, dholl, and ghee, so the people make up the deficiency by chewing cane continuously. The saccharin gets in its fine work, and the result is almost universal toothache. The ailment, in fact, is so common that if a man should plead it as an excuse for absenting himself from work he would be put down at once as a "shirker."—D. S. RICARD, *Record*.

PRINCIPAL ALLOYS.—A combination of zinc and copper makes bell metal.—A combination of copper and tin makes bronze metal.—A combination of antimony, tin, copper and bismuth makes britannia metal.—A combination of copper and tin makes cannon metal.—A combination of copper and zinc makes Dutch gold.—A combination of copper, nickel and zinc, with sometimes a little iron and tin, makes German silver.—A combination of gold and copper makes standard gold.—A combination of gold, copper and silver

makes old standard gold.—A combination of tin and copper makes gun metal.—A combination of copper and zinc makes mosaic gold.—A combination of tin and lead makes pewter.—A combination of lead and a little arsenic makes sheet metal.—A combination of silver and copper makes standard silver.—A combination of tin and lead makes solder.—A combination of lead and antimony makes type metal.—A combination of copper and arsenic makes white copper.—*Popular Mechanics.*

ROBBERIES.—L. M. Place, Palo Alto, Cal., March 6, $100.—C. G. Skinner, San Diego, Cal., Feb. 18, $100.—American Painless dentists, Indianapolis, March 2, $100.—L. S. Gable, Waverley, Ia., March 18, $60.—W. H. Fallon, Pittsfield, Mass., March 19, $30.—F. S. Faxon, Brockton, Mass., March 12, $35.—W. P. Seaquist, Mankato, Minn., March 8, $20.—C. M. McLean, Kansas City, Mo., March 2, $150.—March 23, a woman left her purse in the waiting room of a dentist's office while having some work done and a sneak thief "absorbed" it.—W. T. Richards, Newark, N. J., March 29, $30.—Julian Clarke, Brooklyn, March 14, $10.—Chas. Walrad, Johnstown, N. Y., March 19, $85.—B. M. Smith, Wilkesbarre, Pa., March 27, $40.—Belle Carle, Wilkesbarre, Pa., March 26, $15.—P. X. O'Donnell, Hazelton, Pa., March 1, $35.—O. R. Schroeder, Tomah, Wis., March 18, $15.—W. H. Bailey, Chippewa Falls, Wis., March 12, $30.—C. S. Cook, Chippewa Falls, Wis., March 3, $70.—R. W. Bingham, Eau Claire, Wis., March 11, $25.—H. E. Branstead, Eau Claire, Wis., March 11, $15.

SEALING ARSENICAL APPLICATIONS.—Prepare the cavity margins as for permanent fillings. If gum hemorrhage ensues, pack with cotton saturated with adrenalin chlorid while preparing application and filling. When everything is ready remove the cotton; syringe the cavity with warm water; lay in a piece of asbestos felt about large enough to cover the floor of the cavity; cover the cervical wall of the cavity with amalgam until the filling reaches beyond the gum margin; press the asbestos felt away from the floor of the cavity and place the application in position in the space previously occupied by the felt. Press back the asbestos felt over the application and fill the remainder of the cavity. When it is desirable to remove the pulp, drill down behind the filling, extending the cavity sufficiently to admit of direct access to the canals, or, if sufficient enamel wall exists between the filling and the point directly over the pulp-chamber to warrant it, open through the fissures without any regard to the filling. This method protects the gum from the action of arsenic and simplifies the after-treatment.—R. E. SPARKS, *Dominion.*

TOOTH HAD WORMS.—The Chinese dentist is said to use a forcep, one handle of which is kept loaded with larvæ that somehow, during the attempts at extraction, fall into the beaks of the instrument and are afterwards lifted out at so many "cash" per worm, the number depending on the financial resources of the patient, and his willingness to part with his money.

The notion that worms are responsible for toothache is by no means confined to the "heathen." We call to mind a case, related years ago in a

Western New York meeting, in which the speaker averred that he had recently extracted a tooth, and until he could otherwise dispose of the thing placed it on the window sill. Later he picked it up and to his great surprise found a worm—"a veritable maggot"—in the cavity of decay. This was interesting, especially to "a grave and reverend senior" from "up state," who was something of a cross-examiner. He asked: "Doctor, do I understand that you had placed this tooth on the window sill?" "Yes, sir." "Do you call to mind the contents of the cavity; was there putrescent matter there?" "Yes, sir, and a putrescent pulp, too." "What time of year did this occur?" "August last." "Any blow-flies where you live, Doctor?"—*D. O. & Lab.*

KOPLIK SPOTS.—Ruedel (*N. Y. Med. Jour.*) confirms the diagnostic value of the Koplik spots as an early sign of measles. He had occasion to observe an epidemic of the disease; in the majority of cases the exanthem appeared upon the inside of the cheek and upon the soft palate for some days before the appearance of the cutaneous eruption. In cases of rubeola no mucous eruption was observed, while in scarlet fever patients such an eruption was noticed without the characteristic whitish spots, and consisting of many minute red dots, the edges of which were scarcely distinguishable from the surrounding mucosa.

A CORRECTION.—In the DIGEST for March, 1904, we reprinted an article from the *Stomatologist*, and we now take pleasure in reprinting an explanation from the *Stomatologist* by the author of that article. It is as follows—"CORRECTION. In THE STOMATOLOGIST for January, 1904, in an article on "Hot Water as an Obtundent," the writer gave credit to Mr. Shoenberg of California as the inventor of a recent appliance by which hot water was successfully used for the desensitizing of dentin for the excavation of cavities or the grinding of living teeth. This was an error which the writer now desires to correct. The method, as well as the appliance, were originated by Dr. A. F. Merriman, Jr., of Oakland, Cal., to whom full credit is due. As originally constructed, illuminating gas was used to heat the water, but later Mr. Shoenberg devised an electric heater for the purpose, which is both more compact and convenient. This electric heater has largely, if not entirely, superseded the gas-heating appliance in the hands of Dr. Platt, Dr. Merriman and others who are employing this method of obtunding dentin. The writer prepared the January article after a conversation with Dr. Platt, but as no notes were made until he returned to his office Mr. Shoenberg's name was inadvertently substituted for that of Dr. Merriman. The undersigned takes pleasure in correcting the mistake he made.—S. H. GUILFORD."

ILLEGAL PRACTITIONERS.—March 7, the employe of a dental parlor at Palo Alto, Cal., was fined $50 for practicing dentistry without a license.—March 9, a man at Los Angeles was fined $50 and costs for practising dentistry without a license.—Some weeks ago a man employed as a laboratory dentist in a dental parlor at Denver was fined $100 for practising dentistry without a license. He has since then been guilty of the same offense, but on March 15 the cases against him were dismissed with costs on his promise not to again

cause trouble.—March 22, a man in Chicago was fined $30 and costs for practising dentistry without a license.—March 31, a dentist in Chicago was fined $25 and costs for practising without a license. March 29, the employe of a dental parlor at Belleville, Ill., was fined $25 and costs for practising without being registered.—March 29, a man at East St. Louis, Ill., was fined $25 and costs for practising dentistry illegally, and when he made a disturbance because of the size of the fine he was fined $3 and costs for disturbing the peace.—March 29, another man at East St. Louis, Ill., was fined $25 and costs for practising dentistry without a license.—March 17, a barber at Baltimore was fined for extracting teeth without a certificate from the dental board.—March 22, the proprietor of a dental parlor at St. Louis was fined $50 for practising dentistry without a license.—March 11, the New Jersey Board brought suit against the proprietor of a dental parlor at Trenton for practising dentistry without a license.

To Refit a Plate.—Take a large engine bur and roughen the under side by cutting away all the rubber that comes in contact with the gum tissue. Take a piece of modeling composition, soften it in warm water, and put it around the under surface of the plate. Insert it in the mouth, press it down, and let the patient close the jaws. See if the bite be correct and the teeth as high as you want them. If everything be as desired, instruct the patient to keep the teeth closed while you take the syringe and chill the modeling composition with cold water. Remove the plate and hold it in cold water or under the hydrant until the composition is thoroughly chilled. Take a sharp knife and trim the composition down just as you want your plate when finished, or nearly so. Return it to the mouth and instruct the patient to bite. Look to see if the bite, length of teeth, and everything is as it should be; remove and invest in plaster, in the lower half of the flask, with the teeth downward. Bring the plaster up even with the edge or rim of the plate, put in your separating fluid or whatever you use—and, by the way, you will find tissue paper as good as anything—and pour the upper half of the flask. Separate after heating in hot water, pack rubber where the composition was, and vulcanize. This can be done in less than half the time it takes to make a new plate and is just as good. I have done this a few times with an upper plate, but if there be any undercut it is hard to separate. Where there is no undercut, however, it is an easy way to remedy an upper plate after it gets loose from absorption of the alveolar process.—J. T. Phillips, *Hints.*

Damage Suits.—March 25, a woman in San Francisco brought suit against a dental firm for $10,000 damages, alleging that while one of the operators was extracting a tooth he broke her jaw bone.—March 27, a woman in San Francisco sued a dentist for $3,000 damages, alleging that because of his unskillful extraction of two teeth, and because of his failure to treat the parts afterwards, necrosis set in and she had to have part of her jawbone cut away.—March 2, a woman in Montreal sued a dentist for $5,000 damages, alleging that while extracting some teeth he left several roots in the jaw,

and that she has since been unable to eat solid food.—March 21, a woman in Denver sued F. W. Tarbell, a dentist of that city, for $5,000 damages for breach of promise and defamation of character. She also makes other serious charges against him.—March 3, a woman in Indianapolis sued the proprietors of a dental parlor for $10,000 damages, alleging that in extracting a tooth one of them broke her jaw bone and left her in ignorance of the fact until her condition was serious and she had to undergo an operation at a hospital.—March 11, a woman in Brooklyn recovered $400 damages from a dentist for "pulling a sound tooth and unskillful treatment of an abscess."—March 18, a man in Cincinnati obtained a verdict for $3,500 damages against a dentist. He sued for $5,000 damages, alleging injury from unskillful work.—March 10, a dentist at Bellefontine, O., took a set of teeth from the mouth of a woman patient because she could not pay a $3 balance due on them. She had him arrested and he was heavily fined on the charges of assault and battery and larceny.—March 20, a dentist at Providence, R. I., sued a patient for $300 for professional services, alleging that the patient had secured the work by misrepresenting his financial condition. The jury, however, gave a verdict for only $16.80.

Got No Use For Doctors—

"I hain't got no use for doctors,
  Folks is better off without.
Doctors kills more men and women
  Than the rheumatism and gout."
There's the fuddle-headed fellow
  Who gets drunk and calls you "Doc."
With no more regard for manners
  Than a Chinese Jabberwock.

If he lived a million eons
  He would never be polite,
But would hand you out that insult
  Every time you came in sight.
And you feel that you would rather
  Break that fellow's worthless bones
Than be King of old Dahomey
  With his concubines and thrones.

All the fools are not in breeches,
  Some go 'round in petticoats
With as much of proud importance
  As a pirate cutting throats.
These calamitous old grannies
  Snoop around among the sick
Each declaring she is able
  To trump in, and take the trick.

—*Dr. H. W. Roby, Alk. Clinic.*